



OXFORD
ECONOMICS

Oxford Economics Global Model User Guide

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1 Introduction

The Oxford Economics Global Macro Model is a quarterly linked international econometric model, which runs as a Windows application. You can use it to:

- Examine how economies react to changes in the economic environment
- Produce your own macroeconomic forecasts
- Perform scenario analysis
- Extract quarterly or annual data for approximately 10,000 variables for use in other spreadsheet, statistical or graphics software packages

Every month or quarter you will receive a CD-ROM or download the installation file containing an up-to-date database covering the past and the Oxford Economics forecast for the future. The Oxford Economics software allows you to examine the forecasts in either graphical or tabular form. The assumptions made by Oxford Economics staff economists in the preparation of the forecast may be examined and easily altered. By altering Oxford Economics assumptions and running the model, you can produce your own databases containing your own forecasts and scenarios. Data from either an Oxford Economics or user-developed database can be exported to other Windows-based software packages, or to an ASCII file for use in DOS applications.

The most important consideration in the design of the software has been ease of use. At all times the software tries to be self-explanatory and to guide the user through the process of producing forecasts and extracting data. An on-line help facility is also available and Oxford Economics staff are always available to answer any questions and to resolve any problems encountered. In addition, regular workshops on using the model are available. No knowledge of econometrics is necessary to produce useful forecasts.

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2 Installation

2.1 System requirements

The Oxford Economics Model requires a PC with the following:

- i. CD-ROM drive or Internet Access
- ii. At least 85 Mbytes of hard disk space
- iii. 64 Mbytes or more RAM
- iv. A pentium or better processor
- v. Color monitor and graphics card
- vi. Windows NT, 2000, XP

2.2 Installation procedure

From a CD-ROM: Place the CD-ROM in its drive. From the Start Menu select Run, then navigate to the CD-ROM drive and INSTALL.EXE. Then follow the on-screen installation instructions.

From an installation file downloaded from our website: The installation file will be a self-extracting .EXE file named GBLMACRLM5.EXE or GBLMACRLM10.EXE, depending on whether the database includes a 5- or 10-year forecast. Navigate to it and double-click on it. Then follow the on-screen installation instructions

2.3 Using a Network

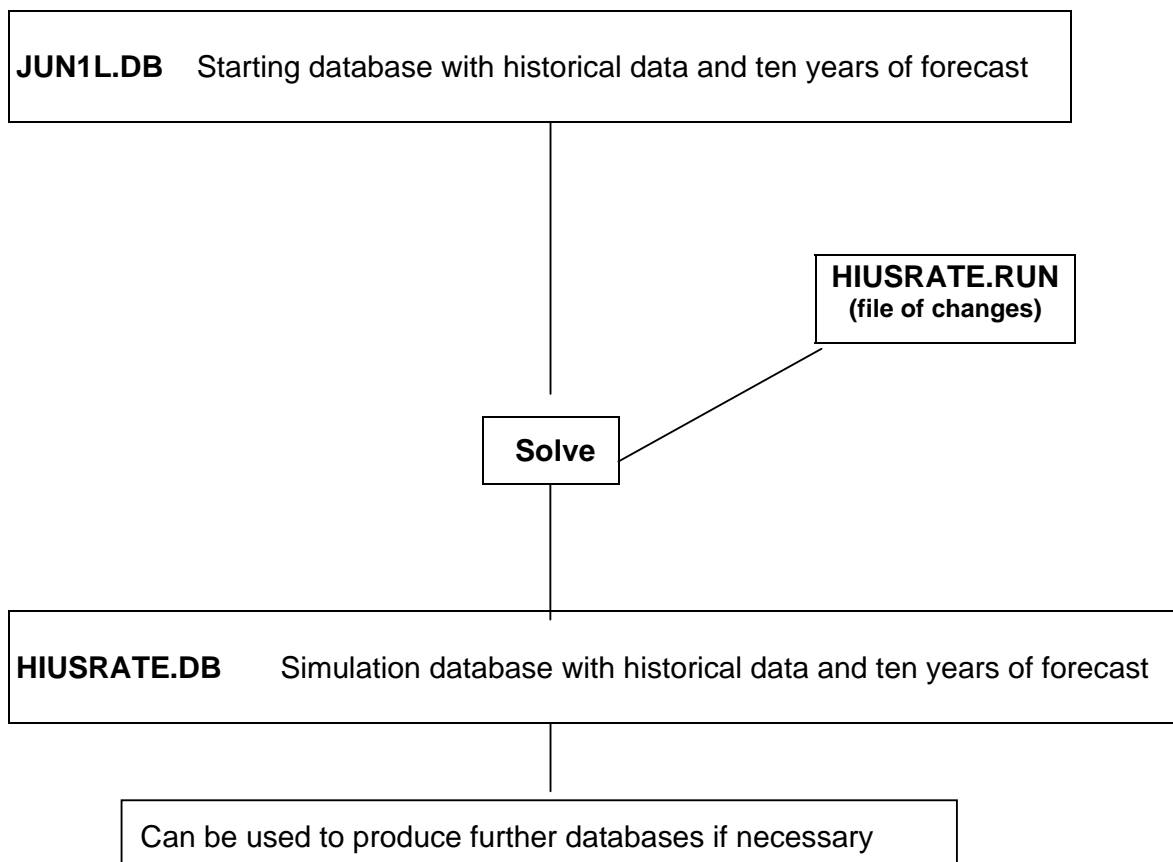
At installation the entire software may be loaded onto a network drive. However, it is preferable to have the software on your own local (C:) drive for performance purposes.

3 Overview

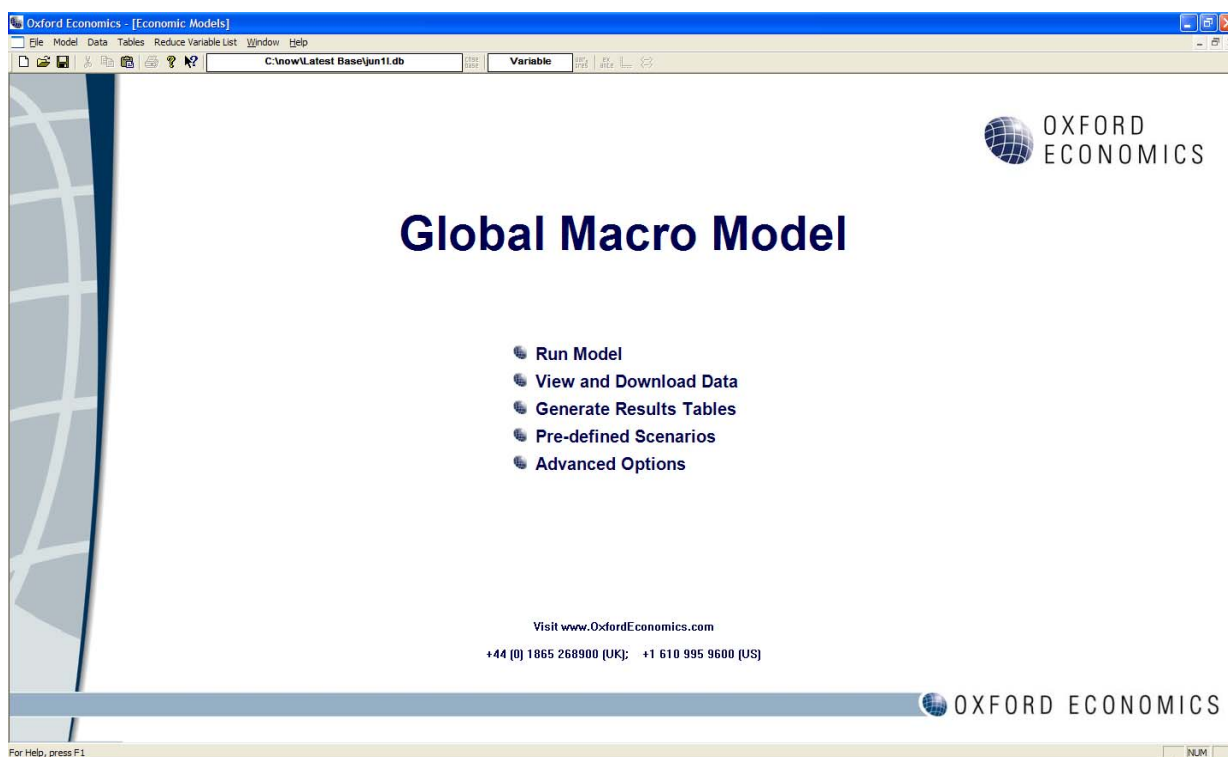
3.1 The Process

In this chapter we will take you through the process of producing a customised simulation with the Global Macro Model. This will provide an overview of the capabilities of the system without going through an exhaustive discussion of all of the options available (this will be left for later chapters).

The diagram below shows the process of creating a new simulation database from the base forecast.



To begin, double click on the Oxford Economics icon on your desktop.



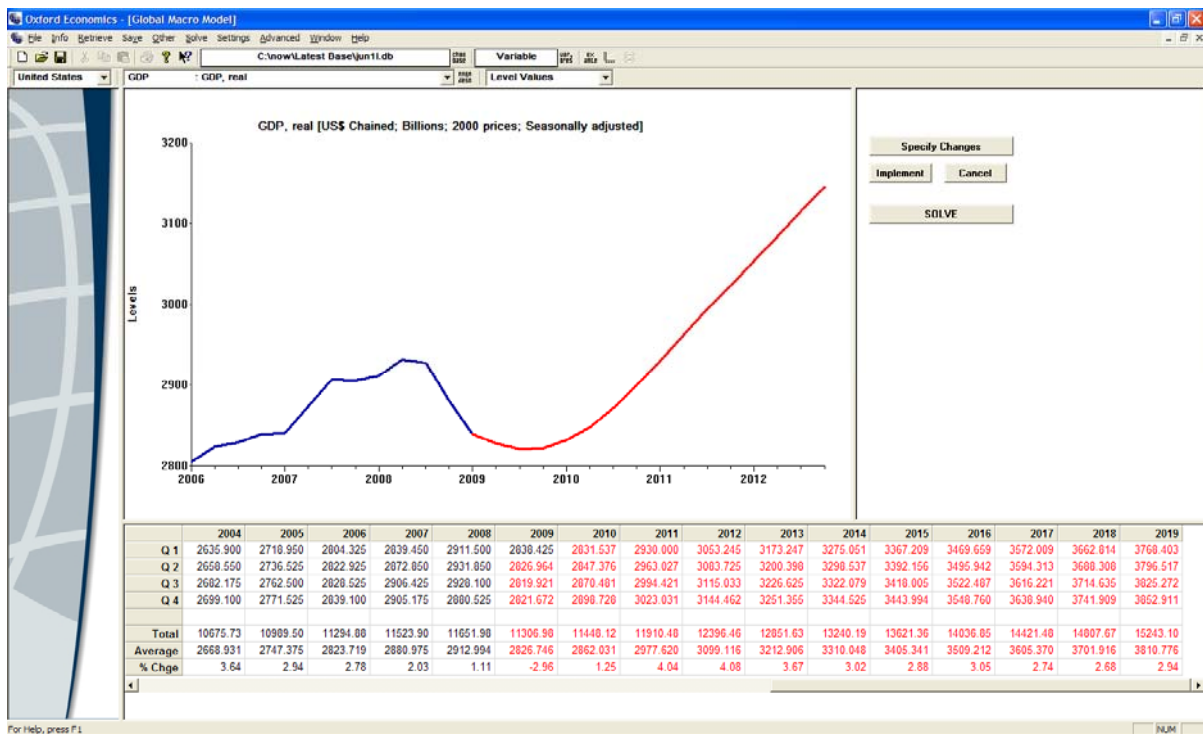
The first screen provides access to four main areas of activity:

- **Run Model.** As the label implies, this button provides access to the Global Model. It also allows the user to examine individual series both graphically and numerically and to change the forecast paths of any series. Once all series have been altered according to the user's design, the model can be run, which will incorporate those changes and the effects of those changes on other variables into a new database.
- **View and Download Data.** This button provides access to the facility for viewing and comparing a number of series from different countries and different databases. It also allows the user to export data in a format accessible from other software programs.
- **Generate Results Tables.** This button allows the user to produce a number of standard tables from any database.
- **Pre Defined Scenarios.** This button allows the user to implement a number of standard shocks to perform scenario analysis. One example is applying a \$10 per barrel increase in the world oil price. This will run automatically when selected and there is then an option to see the results for all countries or just a selection of countries. Tables showing the differences to key variables after the shock will display automatically.

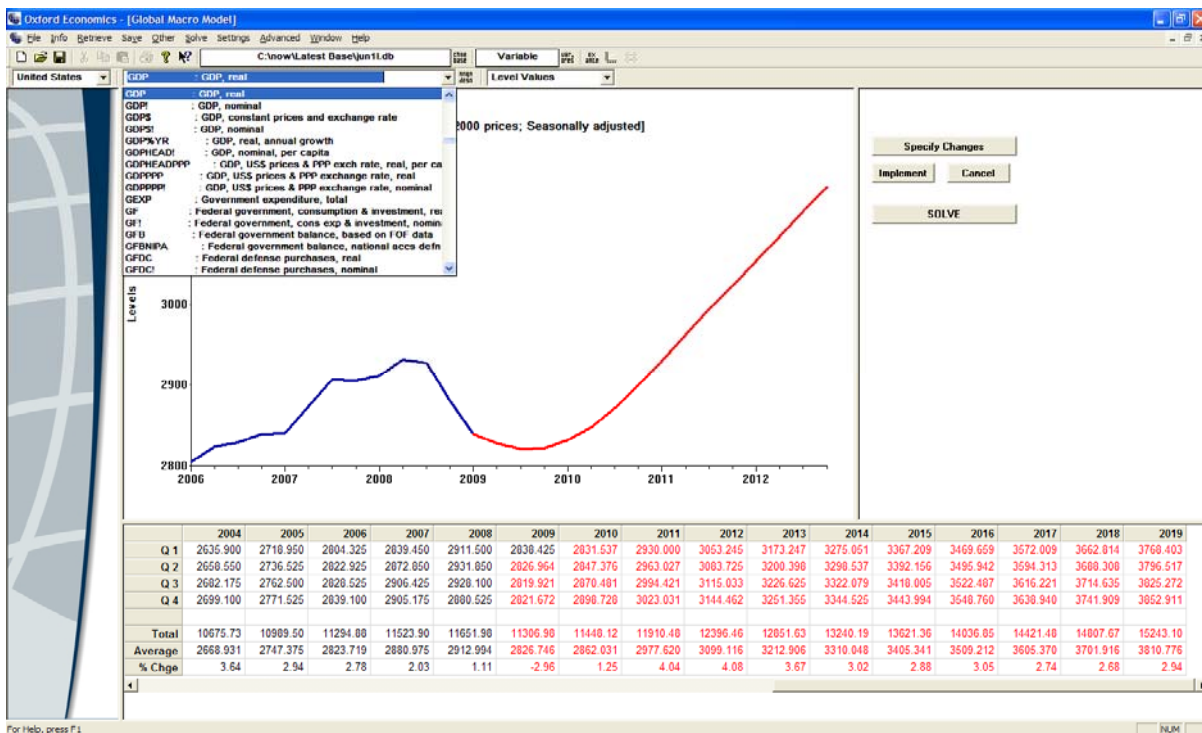
In addition to the four main options there are four advanced options. Click on advanced options.

- Design User Tables Templates. This button allows the user to design templates for results tables themselves and to decide specific table titles, subtitles, and data series and series descriptions to be included.
- Generate Tables from User Templates. This button allows the user to generate tables from templates created by the user.
- List information from database. There are several ways to list parts of a database that may be useful to the forecaster. One example is a listing of variable values and residuals; another is a list all of the historical endpoints for series. It is also possible to generate the differences or percentage differences between two databases on a series by series basis.
- Alternative Data Facility. This button provides access to the facility for moving data in or out of the system in quantity. The data may be model series or calculations based on one or more model series. In addition, the user can compare data or data calculations between databases.

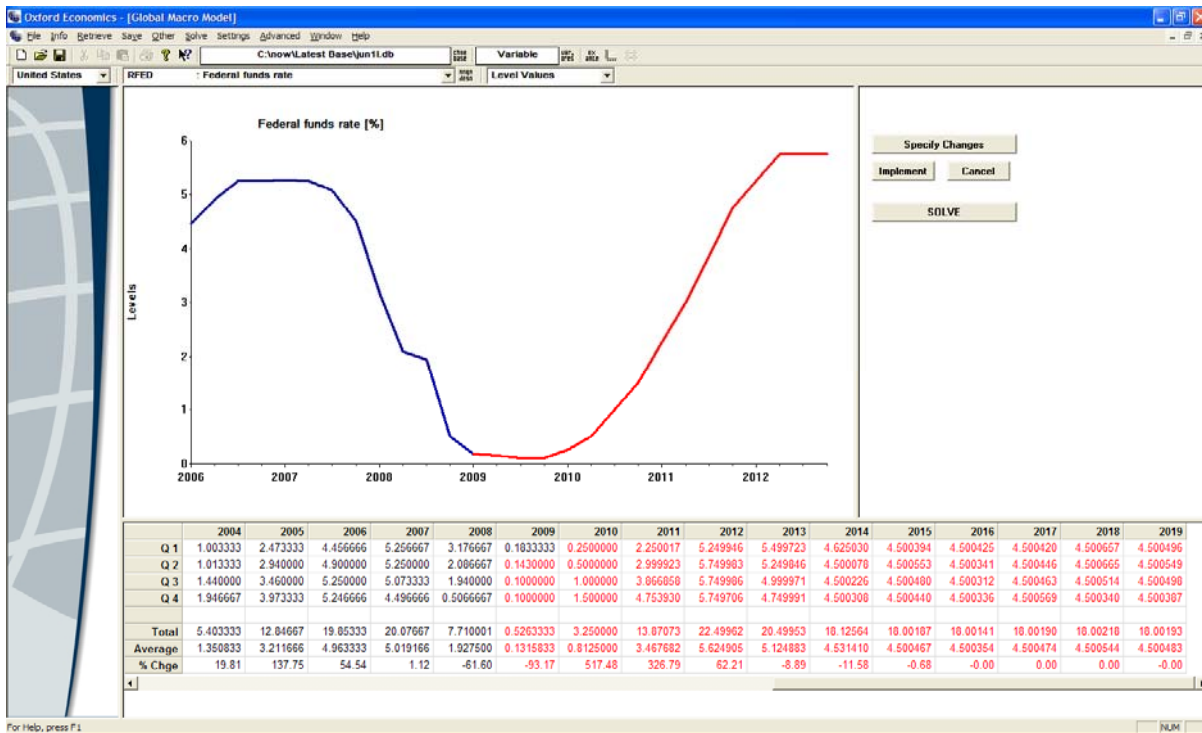
3.2 Changing a variable



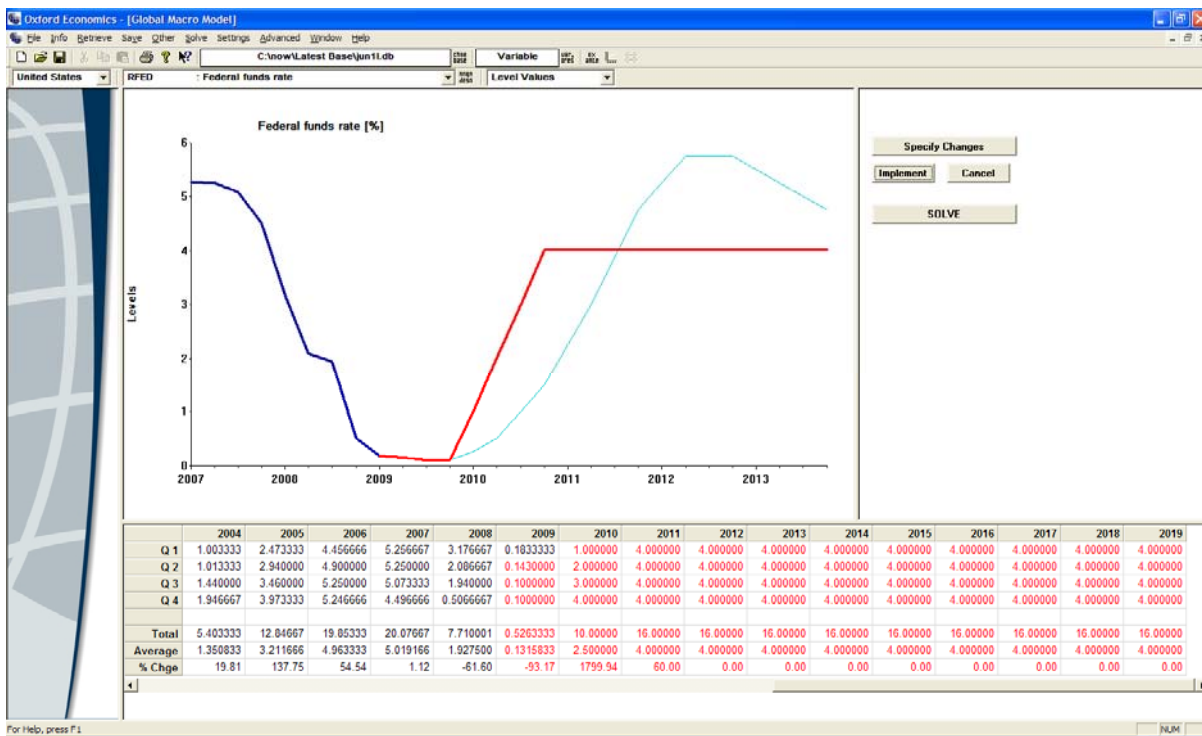
Click the run model option and select the latest database you have. By default, the variable data screen starts with real GDP for the US from the selected database. Each column of data represents one year – the four quarterly observations are listed above the annual total, annual average, and annual percent change. Historical data – actual figures released by the appropriate statistical agency – are displayed in black, while forecasts – supplied by Oxford Economics – are in red. Note: the June 2009 10-year and 5-year databases were the source for most of the screen shots in this manual. The data you see will differ if you are working with a different database. Our exercise will focus on a change to US short-term interest rates. By clicking on the down arrow next to the variable description, the variables for the US model are displayed.



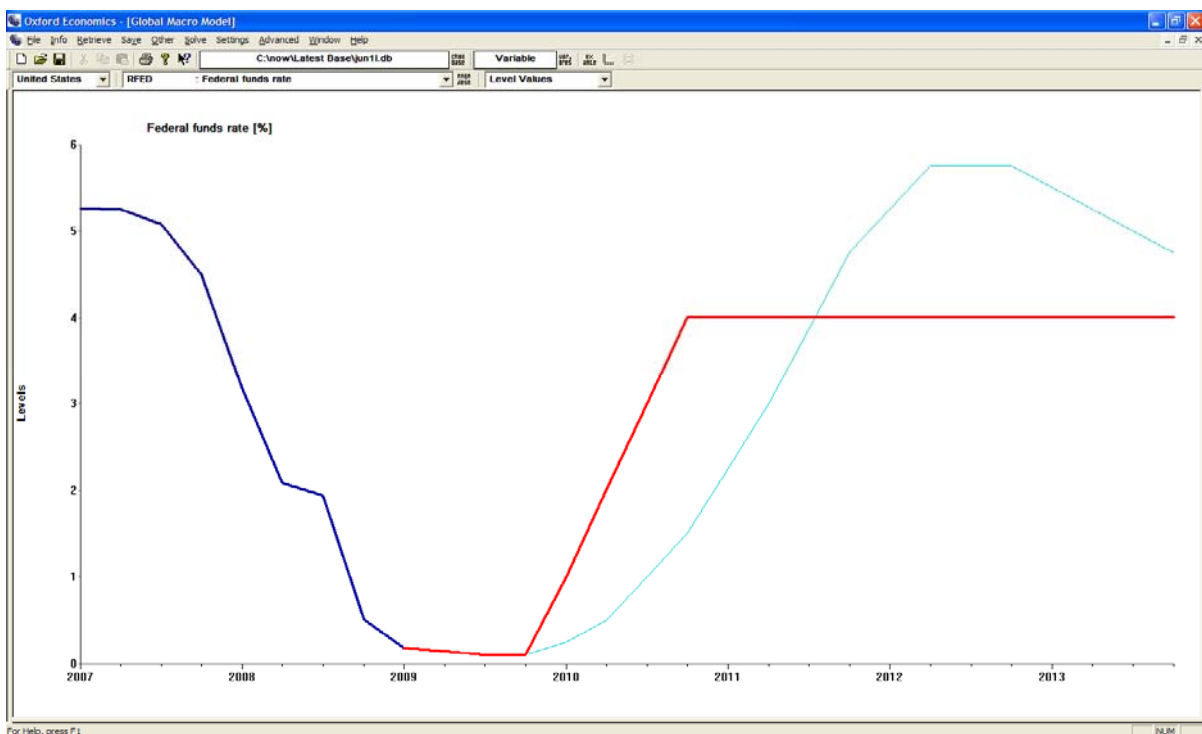
Click on the down arrow in the pull down menu until the federal funds rate appears. Click on that line, and GDP in the display will be replaced by the federal funds rate. Note: the data are alphabetized either by mnemonic or description. The mnemonic for this variable is RFED and the description is 'federal funds rate'.



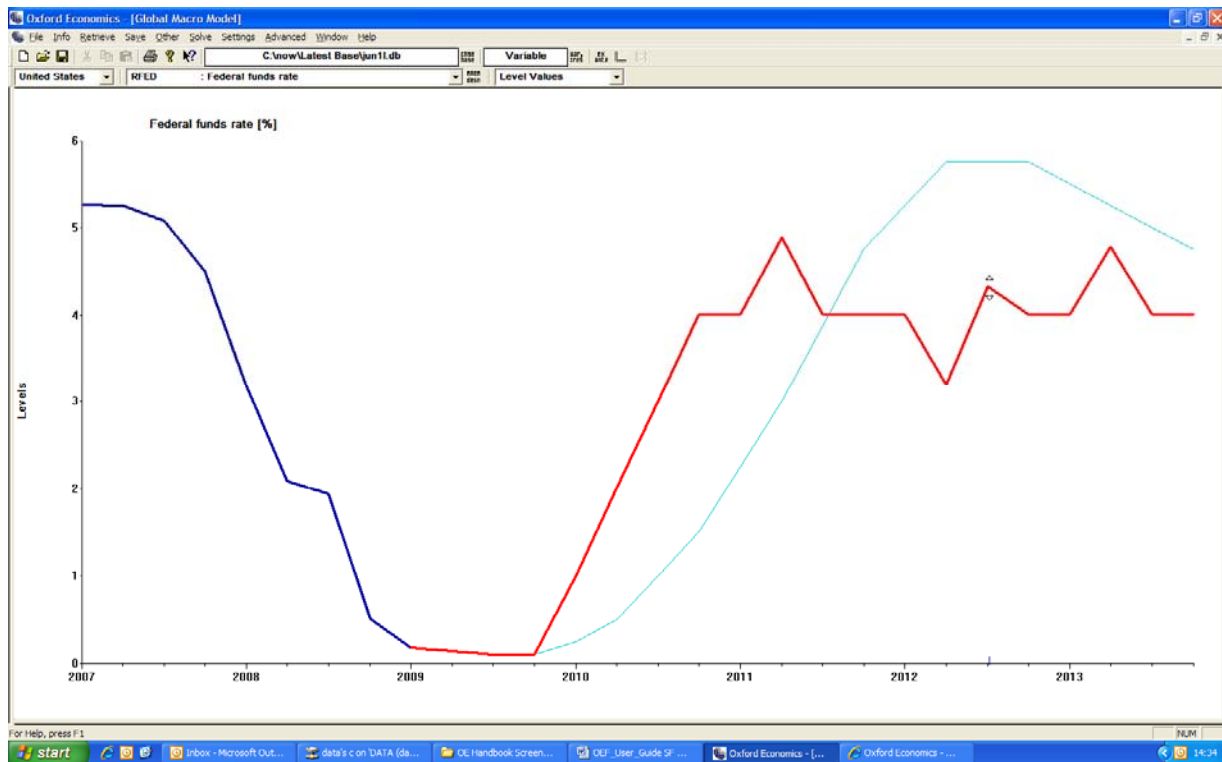
Let's impose a higher path for the federal funds rate from 2010. There are several ways to make changes to the forecast path. The simplest is to overtype the figures provided. Double-click on the box containing the observation for 2010Q1, replace the value with 1, then press the Tab key or Enter key or click on the next box. Replace the value for 2010Q2 with 2 and click on the box for 2010Q3, replace that with 3 and then change the value for 2010Q4 to 4. To hold the series constant at the 2010Q4 level, right click and copy the 2010Q4 level, then highlight the area from 2011-2019 and right click and paste the values. Click on implement to save these changes.



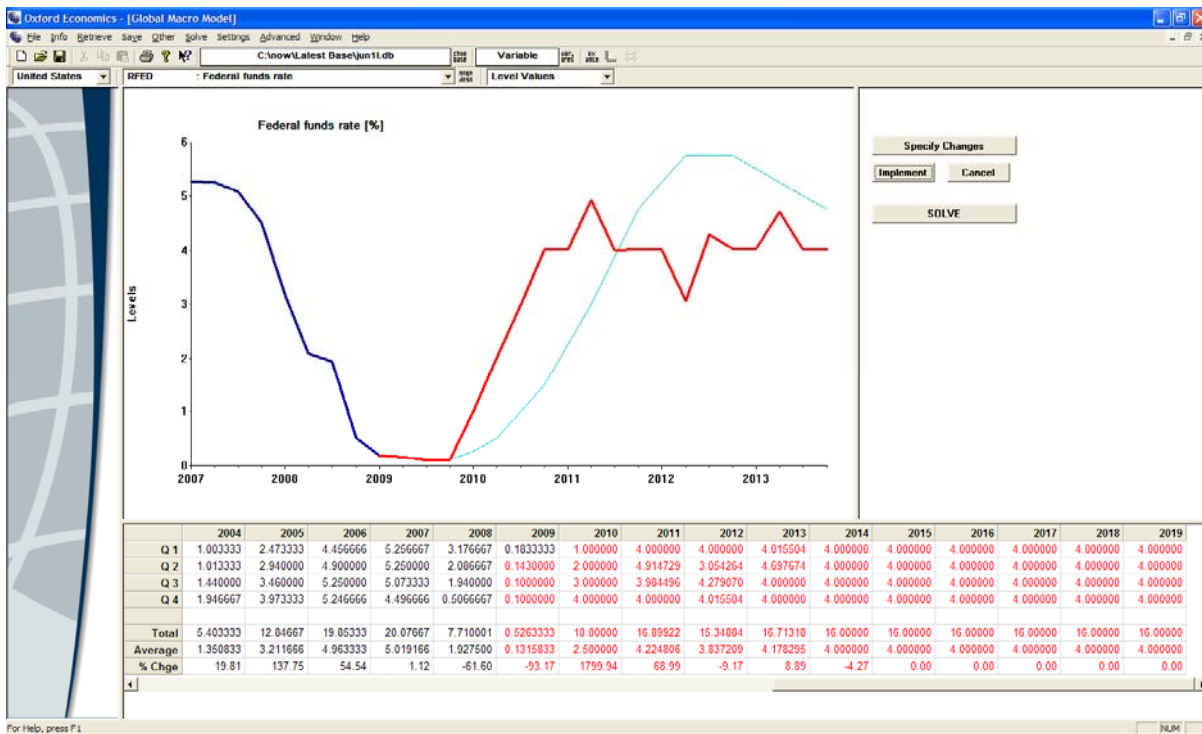
Notice that the graph of the series in the top portion of the screen has been altered to display both the new and the original path for this series. Notice, too, that there is a 'graph' icon on the top right of the top toolbar. Click on the 'graph' icon. You will see a larger graph of the federal funds rate, before and after the change, with historical data differentiated from forecast by means of colour.



If you click on the large graph (please choose a spot where the forecast is flat at 4%) a double vertical arrow will appear, centered on the new line for the series. Hold the left mouse button down and move the mouse up or down. You will see that you are pulling the graph along. By performing this operation on various time periods, you can visually create the path you want.



Then click on the graph icon and you will see that your changes have been read from the large graph and are now reflected in both the data and the small graph.

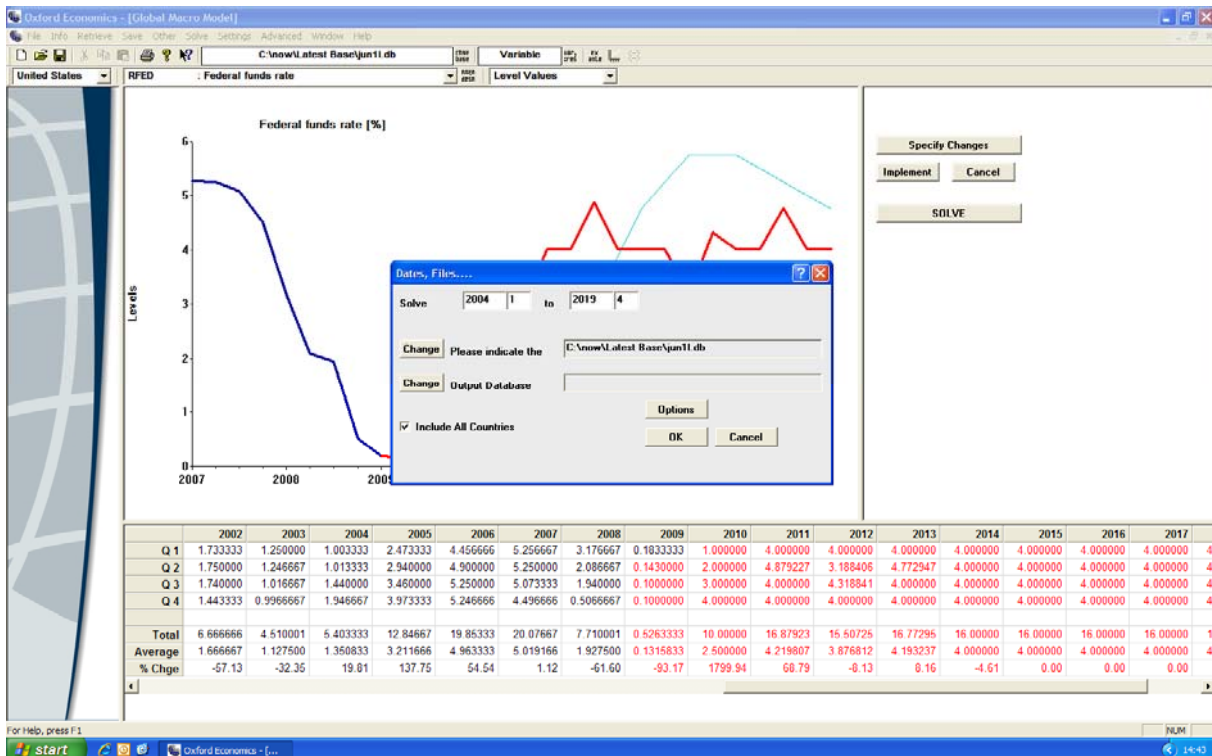


Please return the variable to the flat 4% line before proceeding by repeating the copy and paste function we used earlier in this exercise.

3.3 Solving the model

Click on the button marked **Implement** to add this new path to the file of changes. Then click on the button labelled **Solve**.

The dialog box you have just opened controls the model solution. At the top are the dates for the forecast solution. You can change these by clicking on the appropriate box and over typing. For example, to change the forecast solution period to end in 2015Q4, click on the third box after the label Solve: and replace what is there with 2015. Note: you cannot lengthen the solution period beyond the range of the starting base. The starting database is listed below, JUNE1L.DB, followed by the name of the database to be created. It is always a good idea to name the database so that it is easy to remember its purpose. Click on the box marked **Change** to the left of the Output Base name, which will bring up a standard Windows file opening box listing current database names. Enter a new name – we chose HIUSRATE.



The box labelled **Include All Countries** is checked by default. Since we want to run the entire Global Model, leave it. (If this box is not checked, when the OK button is pressed a screen will appear that offers the option of selecting countries to be included in the solution.) The dialog box now looks like this:

Dates, Files....

Solve 2005 1 to 2015 4

Change Please indicate the C:\now\Latest Base\jun11.db

Change Output Database C:\now\Latest Base\HIUSRATE.db

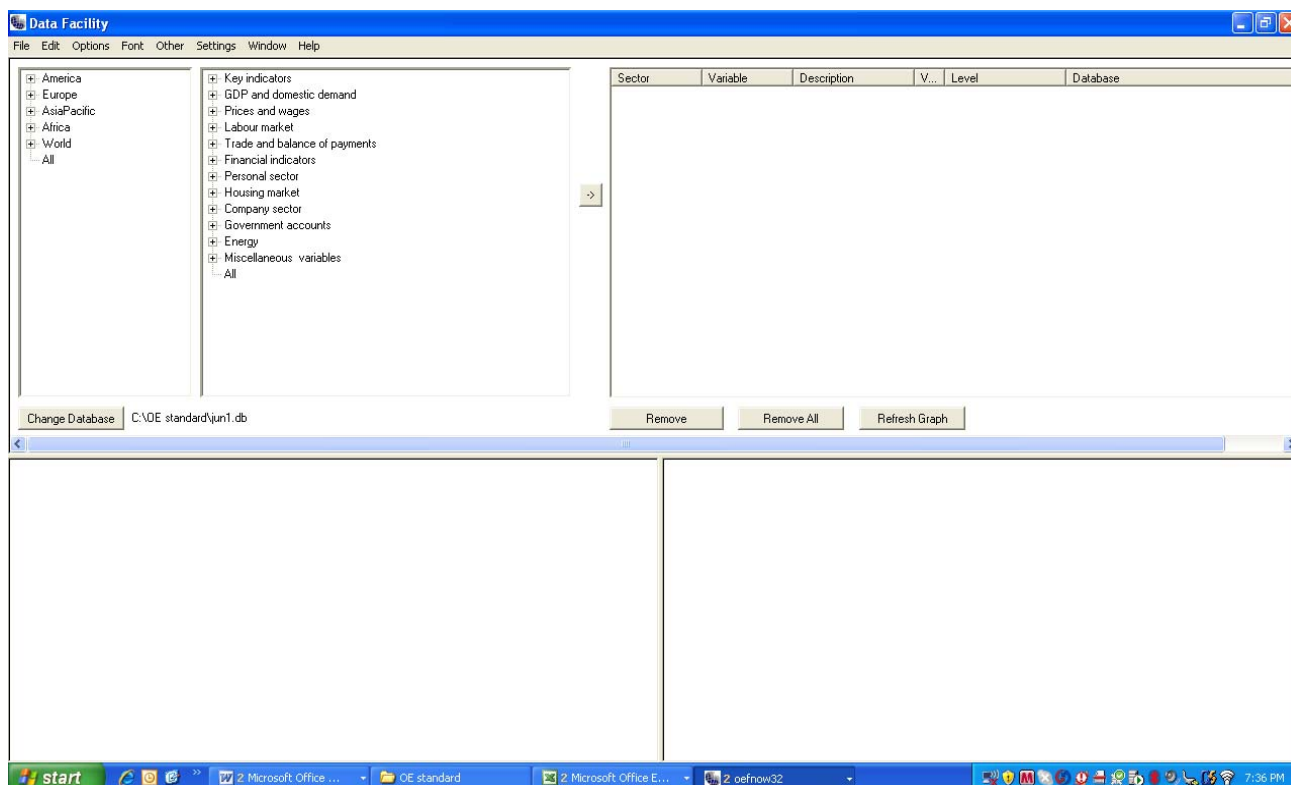
☒ Include All Countries

Options OK Cancel

Click on the button labelled **OK** and the model will begin to solve. While it is running, the text **Solving...** will appear in the middle of the screen. Also a DOS icon will appear in the application bar at the bottom of your screen. If you click on it, you will be able to see the iterations counted for each time period in the solution range. When the forecast is complete, you will be returned to the variable data screen. You will then be asked if you wish to **Continue** or **Update Datafiles**; choose **Continue** and then you will be returned to the main menu screen.

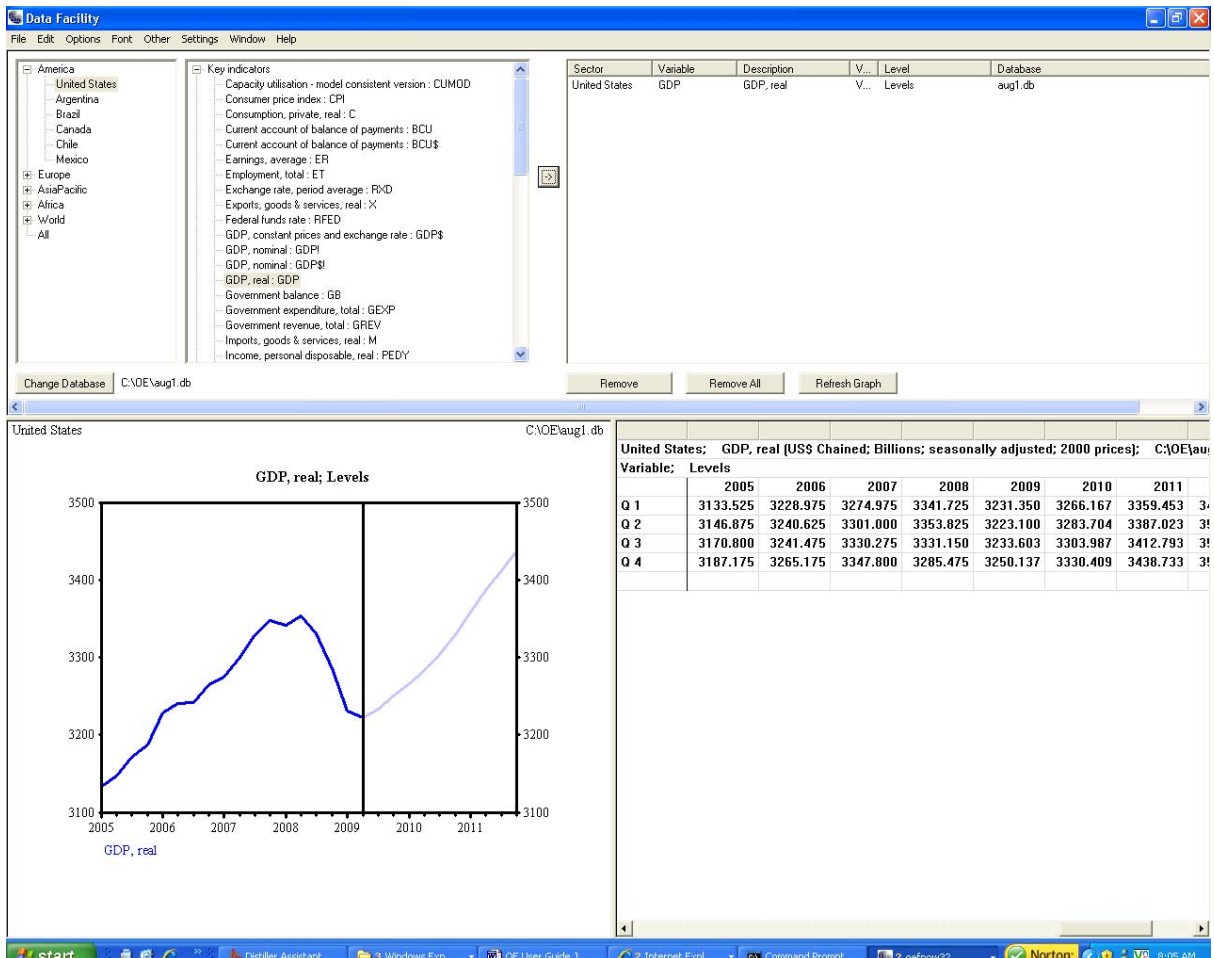
3.4 Viewing the results graphically

Now that our new scenario is complete, we will want to examine the results. One way is to compare a key series from the starting and new databases graphically. To do this, click on the second choice on the main menu screen, **View and Download Data**. That will bring up this screen:

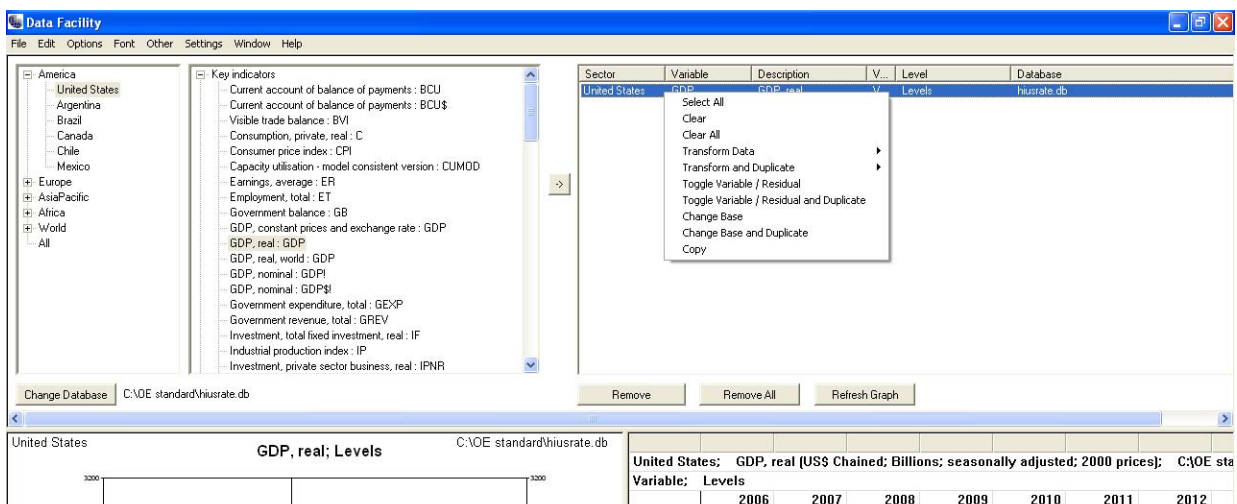


The two boxes in the upper left half of the page contain a tree structure to organize the data series in the model, first by country/region and the second by economic sector. Click on the + sign next to **America** in the first box to expand that part of the tree into the countries in the Americas. Highlight the United States. Then in the second box, click on the + sign next to **Key indicators** and highlight **GDP, real: GDP** (by default, the series are arranged alphabetically by description. In this instance, GDP, real is the description and the GDP following the colon is the mnemonic). Below these boxes, you will see the current database listed. Click on the **Change Database** button to bring up a dialog box that will allow you to switch to HIUSRATE.DB.

Now click on the right arrow button in the middle of the top half of the screen. That will cause the series information to appear in the upper right-hand part of the screen, the graph of the data to appear in the lower left part, and the numerical data in the lower right, as shown on the next page.

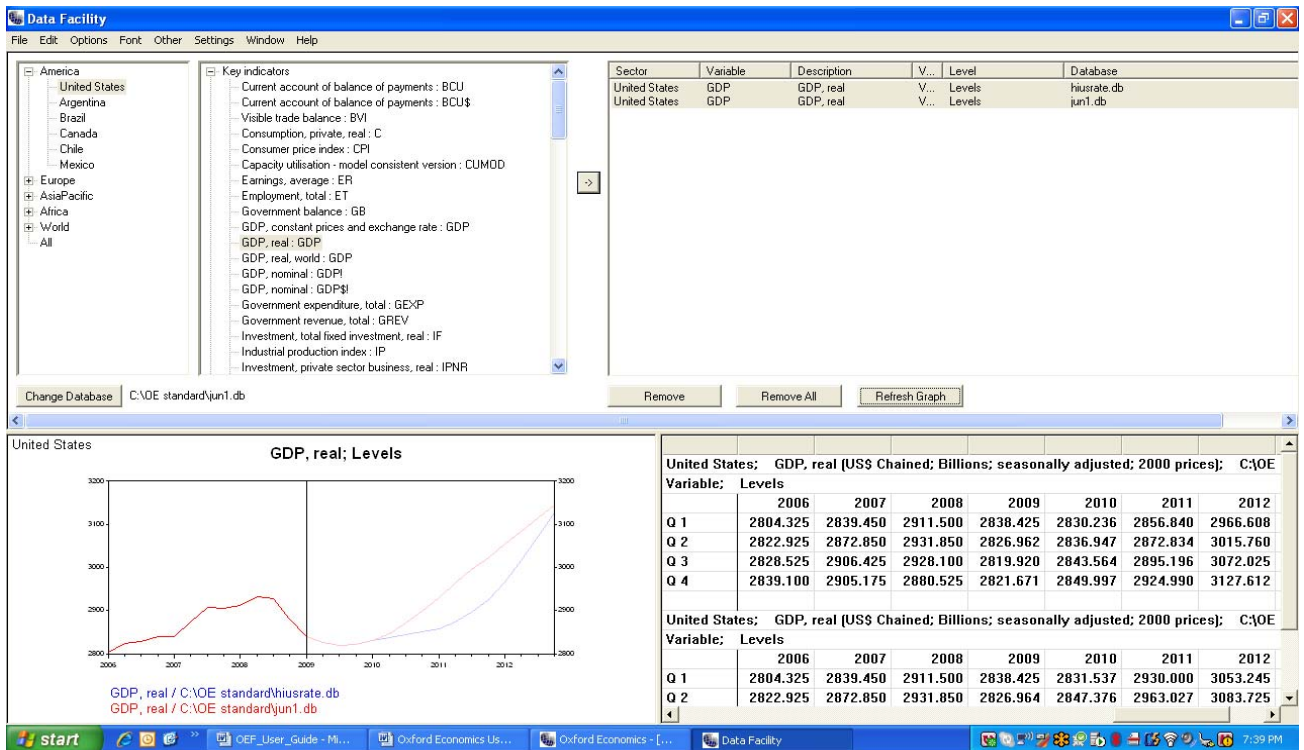


Now highlight the series in the upper right hand field, and click the right mouse button. That brings up a list of options for transforming and adding other versions of the same series.



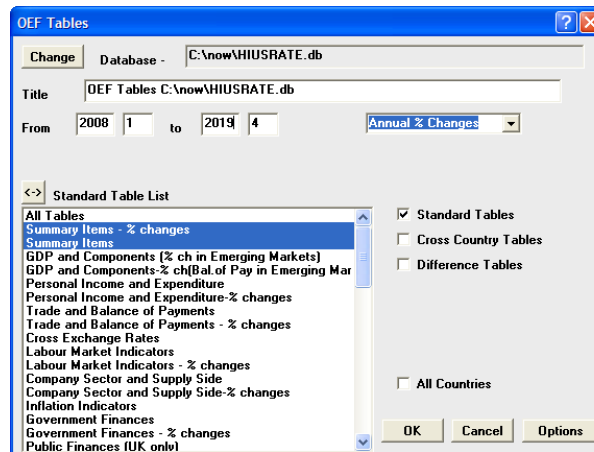
Select the second last option, **Change Base and Duplicate**

That will bring up a dialog box containing the names of all the available databases. Find and click on your starting base, and then on the button labelled **Open**. A second line of series information will appear in the upper right, and a second set of numerical data appears in the lower right. Make sure that both series are highlighted, or both are not highlighted, and then click on the button labelled **Refresh Graph**. That will cause a second line to appear in the graph in the lower left, and you can see that GDP is lower in the scenario with higher short-term interest rates.



3.5 Viewing the results in tables

Another way to view the results of our forecast is in standard tables. Return to the main menu screen by clicking on the Oxford Economics icon at the left end of the toolbar and then selecting Close. Or you may click on the X at the right hand end of the toolbar at the top of the screen. Then select the third icon, **Generate Results Tables**. A standard Windows file opening box will appear, with a list of the available databases. Select HIUSRATE.DB and click on OK. The following dialog box will appear:



Click on the title box and type in an appropriate title for the tables. The database will automatically be set to HIUSRATE.DB and the date range to 2008 through 2015, the date of our forecast. Select the tables you would like to produce from the list box to the left. We chose the two pages of Summary Items and GDP and Components as percentage changes. Note: multiple selections are made by holding the control key down while using the left mouse button to make selections.

To the right, click on the box for Difference Tables. A standard file opening window will appear, asking you to supply the name of the database against which comparisons are to be made. Select your starting base, in our case JUN1L and click on OK. The screen will look like this:.

OEF Tables

Change Database - C:\OE standard\hirusrate.db

Title OEF Tables C:\OE standard\hirusrate.db

From 2008 2 to 2015 4 Q-on-Q Annual Growth

<-> Standard Table List

- All Tables
- Summary Items - % changes
- Summary Items
- GDP and Components (% ch in Emerging Markets)
- GDP and Components-% ch(Bal.of Pay in Emerging Mar
- Personal Income and Expenditure
- Personal Income and Expenditure-% changes
- Trade and Balance of Payments
- Trade and Balance of Payments - % changes
- Cross Exchange Rates
- Labour Market Indicators
- Labour Market Indicators - % changes
- Company Sector and Supply Side
- Company Sector and Supply Side-% changes
- Inflation Indicators
- Government Finances
- Government Finances - % changes
- Public Finances (UK only)

☒ Standard Tables

☐ Cross Country Tables

☒ Difference Tables

☐ All Countries

OK Cancel Options

Click on **OK**. Since we did not select the option to prepare tables for **All Countries**, a box offering a selection of countries will appear. We chose the US and Germany. Click on **OK** to start the table generation.

Solution / Tables / Output by Area

Use <Ctrl><Mouse> to indicate your choice

Solve for

☐ Select All

United States

Japan

China

EuroZone

Germany

France

Italy

United Kingdom

Argentina

Australia

Austria

Belgium

Brazil

Bulgaria

Canada

Chile

Croatia

Czech Republic

Denmark

Finland

OK Cancel

The tables will be brought to the screen in a Windows based browser.

U.S.A. TABLE 1 SUMMARY ITEMS
ANNUAL PERCENTAGE CHANGES, UNLESS OTHERWISE SPECIFIED

	CONSUMERS EXPENDITURE (C)	REAL PERS. DISPOSABLE INCOME (PEDY)	SAVING RATIO (%) (PESR)	REAL GDP (GDP)	INDUSTRIAL PRODUCTION (IP)	UNEMPLOY- MENT RATE (%) (UP)	AVERAGE EARNINGS (ER)	WHOLE ECONOMY PRODUCT- IVITY (GDP/ET)	COMPETIT- IVENESS (2000=100) (WCR)	PRODUCER PRICES (PPI)	CONSUMER PRICES (CPI)	TOTAL PROFITS (COGTP)
YEARS BEGINNING Q1												
2008	0.23	1.26	1.80	1.11	-2.24	5.81	3.35	1.59	79.00	6.37	3.80	-10.10
2009	-0.98	2.30	5.16	-2.96	-10.20	9.32	2.65	0.54	89.38	-3.47	-0.70	-17.25
2010	1.05	1.73	5.02	0.40	1.24	9.08	2.40	0.65	87.70	2.57	1.66	-5.51
2011	1.22	0.82	5.48	1.51	0.22	7.89	1.13	-0.79	87.67	2.24	1.85	1.22
2012	5.10	2.03	3.47	5.51	6.03	5.42	1.40	2.01	93.69	0.56	1.03	16.26
2013	4.91	4.93	1.85	4.80	9.19	4.15	4.51	4.61	81.70	2.59	1.28	5.76
2014	4.92	4.09	1.24	4.37	3.63	4.20	3.37	3.45	80.47	3.03	2.63	10.30
2015	3.35	2.65	0.73	3.48	3.66	4.26	5.84	2.84	78.14	4.18	4.09	22.05
2016	-0.22	0.51	1.53	-0.19	-1.25	5.00	4.41	0.78	78.44	4.37	4.83	12.10
2017	2.37	2.30	1.62	2.74	3.01	5.00	3.67	2.47	76.63	2.04	2.46	0.37
2018	2.16	2.32	1.85	2.48	3.17	5.00	3.74	2.44	74.94	2.34	2.55	7.38
2019	2.29	2.27	1.91	2.94	3.95	5.00	3.60	2.61	79.11	2.14	2.20	10.61
YEARS BEGINNING Q2												
I	1.45	0.58	0.20	2.54	1.39	4.93	3.05	2.50	77.21	7.21	4.20	-1.50
II	1.26	3.33	2.48	2.05	-0.39	5.37	3.53	1.97	76.37	7.87	4.27	-8.32
III	-0.22	0.29	1.31	0.75	-3.19	6.07	3.64	1.21	75.51	9.46	5.23	-9.20
IV	-1.54	0.87	3.22	-0.55	-6.70	6.87	3.17	0.69	87.51	1.38	1.53	-21.51
YEARS BEGINNING Q3												
I	-1.37	2.65	4.41	-2.51	-11.52	8.07	2.85	0.63	92.16	-2.18	-0.18	-17.97
II	-1.92	0.98	5.52	-0.50	-12.23	9.27	2.99	0.15	88.87	-4.75	-0.89	-20.29
III	-1.02	2.89	5.25	-3.69	-10.14	9.85	2.39	0.16	88.62	-6.27	-2.05	-21.14
IV	0.41	2.71	5.44	-2.04	-6.72	10.09	2.37	1.21	87.88	-0.51	0.55	-7.99
YEARS BEGINNING Q4												
I	0.52	1.75	5.59	-0.29	-0.82	10.24	2.45	1.32	87.51	1.75	1.30	-11.08
II	1.10	1.26	5.60	0.35	1.00	10.11	2.40	0.99	87.33	2.75	1.40	-4.09
III	1.37	2.10	5.96	0.84	2.13	9.91	2.45	0.54	87.60	2.88	1.76	-3.00
IV	1.19	1.02	6.06	1.00	1.90	9.27	2.29	-0.27	88.36	2.90	2.00	-2.55
YEARS BEGINNING Q1												
I	0.76	0.72	5.87	0.94	0.88	8.81	1.92	-0.91	88.31	2.90	2.19	-2.71
II	0.92	0.86	5.65	1.20	-0.03	8.15	1.40	-1.12	88.45	2.64	2.04	-1.15
III	1.10	0.93	5.82	1.52	-0.34	7.61	0.80	-1.03	87.48	2.10	1.74	1.15
IV	2.11	0.70	4.97	2.37	0.30	6.99	0.41	-0.00	86.43	1.34	1.45	7.75

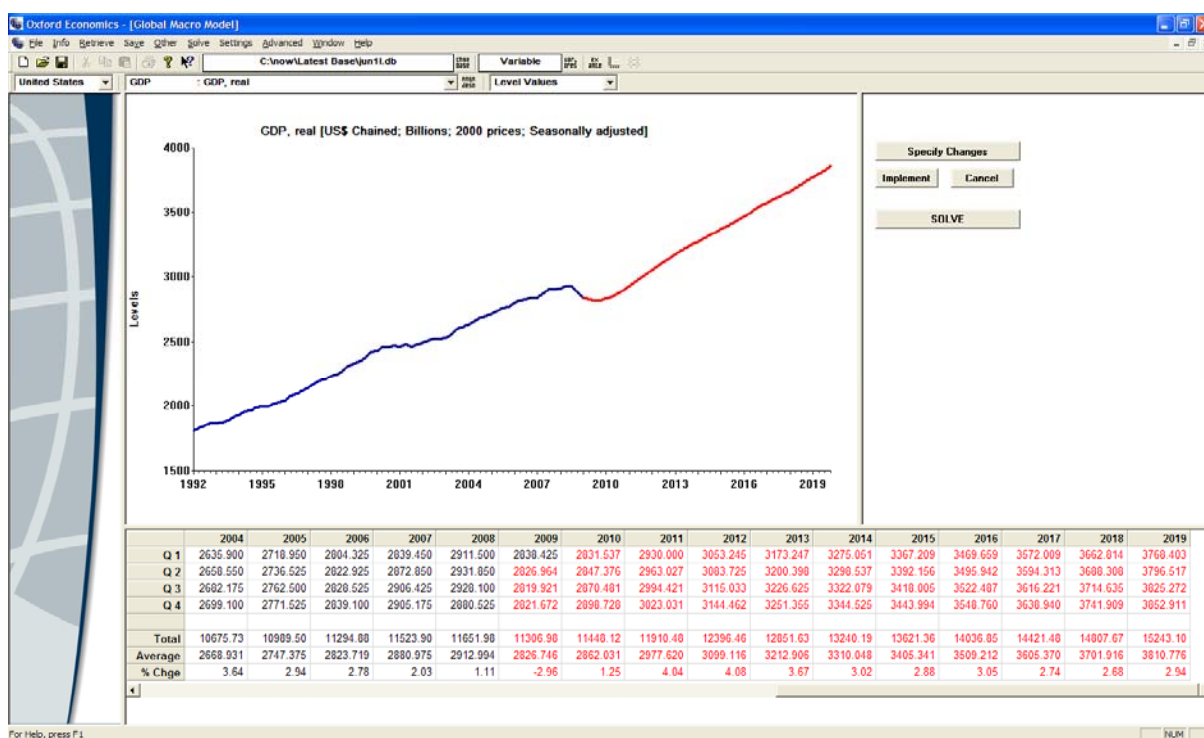
First will be the standard tables we selected for the US and Germany. If you scroll down a few pages, you will see the standard difference tables for those same two countries. These tables calculate the percentage differences in the selected variables between the two bases. The tables are stored in an ASCII file, HIUSRATE.TAB, which can be printed if desired.

This completes our overview of the World Economic Model. The following chapters will provide more complete information on all of the facilities available, many of which have been skipped over in this chapter.

4 Changing Forecast Assumptions

4.1 Selecting and examining a variable

To create your own forecast, it will be necessary to adjust the values of one or more variables, perhaps from a number of different countries. When the model is then solved, those changes will affect the other endogenous variables, resulting in an entirely new scenario. To begin, click on the **Run Model** icon on the first screen. That will open a dialog box offering a choice of available databases. Select one and click on **Open**. By default, the variable change screen starts with real GDP in the US from the selected database.

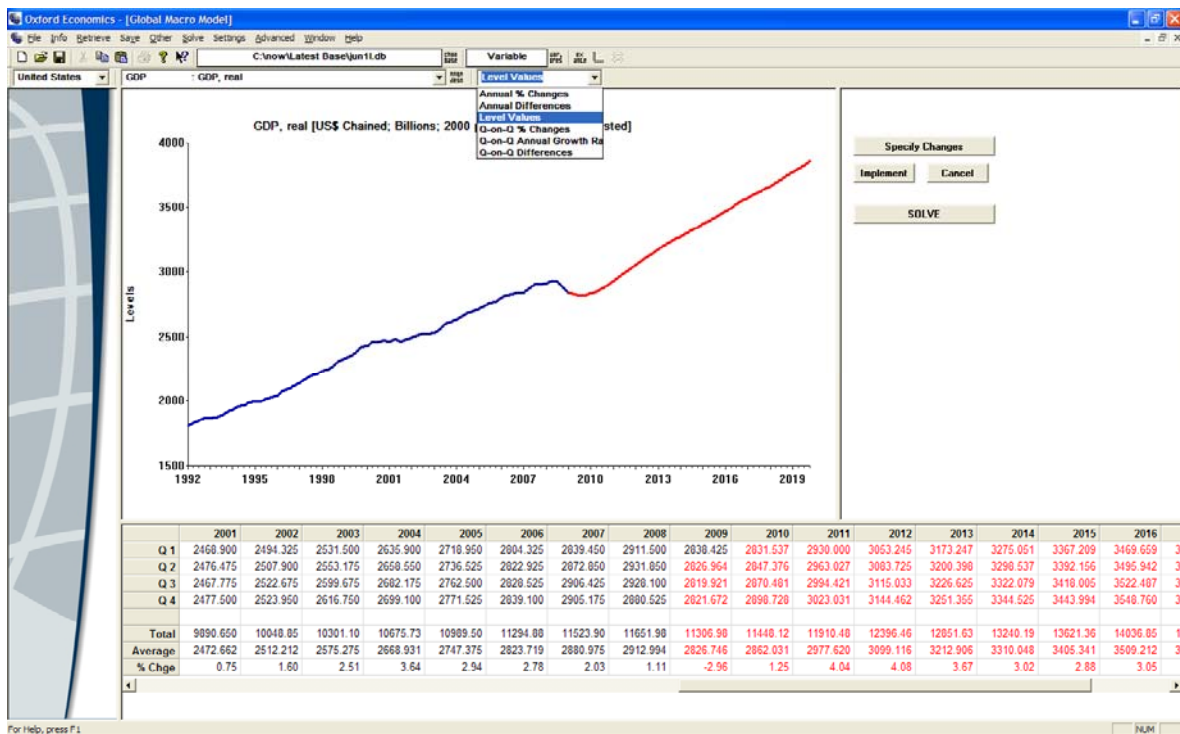


At any time, you may change the open database by clicking on the button marked **chge base** to the right of the database list box. This will bring up the list of available databases again. Select one by clicking on it. This document was prepared with the June 2009 forecast as the starting base.

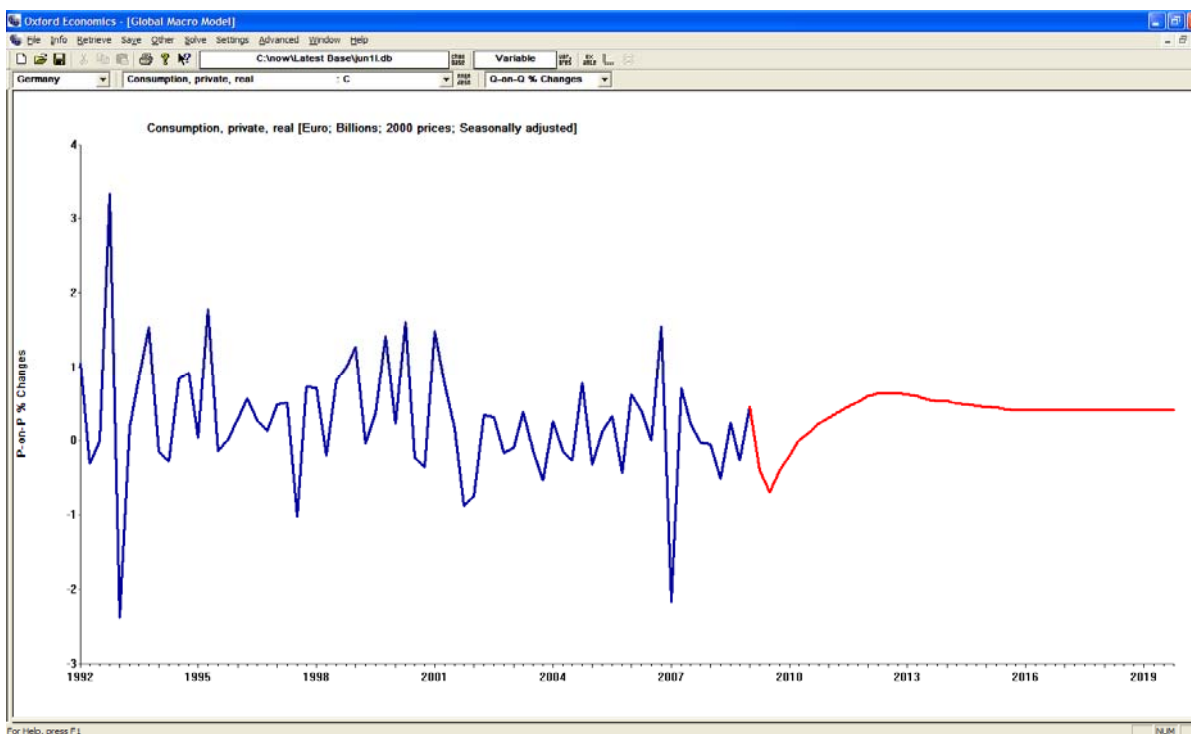
Similarly the list boxes on the next line allow you to switch the focus to a different country and/or variable. Click on the down arrow beside the list box containing **United States** to see the countries and areas available. Clicking on a country name will bring up the same series for the new country, say **Germany**. Click on the down arrow beside the box containing the variable description and name to see a list of all series available for the country that has been selected. Use the scroll bar to scan through the list, and click on a new series to select it – we chose real consumers' expenditure.

The list of variables is displayed in alphabetical order by the variable description. If you are more comfortable with the variable mnemonics, a click on the button to the right of the variable list marked **mnem/desn** will cause the list to be reorganized – alphabetized on the series mnemonic. A second click will return the list to its original order. Note: the variable we chose, real consumers expenditure has mnemonic C and description Consumption, private, real.

There is a wealth of information about the selected variable available to you on this screen. Each column of data represents one calendar year – the four quarterly observations are listed above the annual total, the average and the annual percentage change. Historical data, actual figures released by the appropriate statistical agency, are displayed in black, while forecasts, supplied by Oxford Economics, are in red. The left and right arrow keys can be used to shift the data table backward or forward in time. Clicking on the button labelled **var, res** will replace the variable values with residuals. Over the historical period, the residuals are the differences or the ratios (depending upon whether the equation was estimated in level or in log form) between the equation calculation and the actual historical value. Over the forecast period the residuals are set according to the forecasters' judgment. By default the data are displayed in their level form. However, several transformations are available. There is a list box to the right of the variable name list box, which displays **Levels** when you start. Click on the down arrow to the right to see the available transformations.



Click on another option, say **Q-on-Q % Changes**. This will alter the data displayed to the quarterly percentage changes of the variable. To see a larger version of the graph, click on the graph icon in the toolbar at the top of the page, just above the pulldown arrow for data transformations.



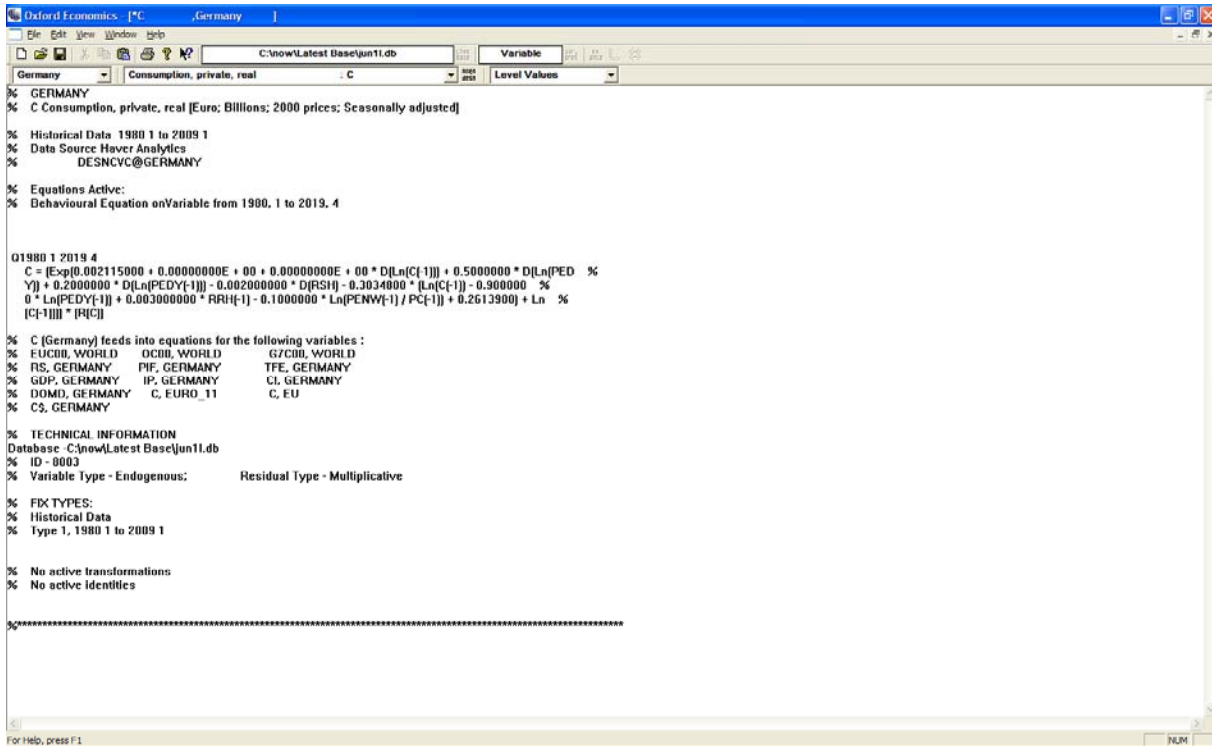
Again, colour is used to distinguish historical data from forecast data, with historical data in blue and forecast in red. After clicking on the graph to activate it, the left and right arrow keys can be used to shift the graph backward or forward in time, and the insert and delete keys can be used to add or delete years of data.

Click on **Info** at the left end of the toolbar at the top of the screen and from the list choose **Info on current variable**. The screen on the next page will appear.

In the upper left hand corner of the screen are repeated the database the variable has been drawn from, the country the variable pertains to, and the series mnemonic. The data source is provided next. Then the equation is provided. In some cases, as in the example above, the equation had been estimated in log form: $\text{Ln}(X) = c + a\text{Ln}(y) + \dots$. The equation is displayed in exponential form:

$X = \text{Exp}(c + a\text{Ln}(y) + \dots)$, as it is incorporated in the model.

The equation is followed by a listing of the variables that are directly affected by this variable – that is, the equations for the variables on the list include some reference to the selected variable. In some cases,



where the equation is particularly long and/or there are many variables directly linked to the selected variable, all of the information will not be visible on the screen. The scroll bar to the right will allow the user to scan through all of the information. It is also possible to send this information to the printer. Just select File and Print from the menu at the top of the screen.

Then there is the technical information. This includes the variable ID number, which is useful for some special purposes, and just below are the variable and residual types. Variables may be endogenous, exogenous or identities, and endogenous variables may have additive or multiplicative residuals. Finally there is information on the date through which there is actual historical data, and a listing of transformations that are in effect, if any.

Return to the variable data screen by clicking on the file icon to the left of the tool bar at the top of the screen and selecting Close. Or you may instead choose to click on the X box at the right hand end of the tool bar. Unless you have previously returned to the variable data screen, the graph of Q-on-Q percentage changes will still be on the screen. If you need to, click on the graph icon to return to the variable data screen.

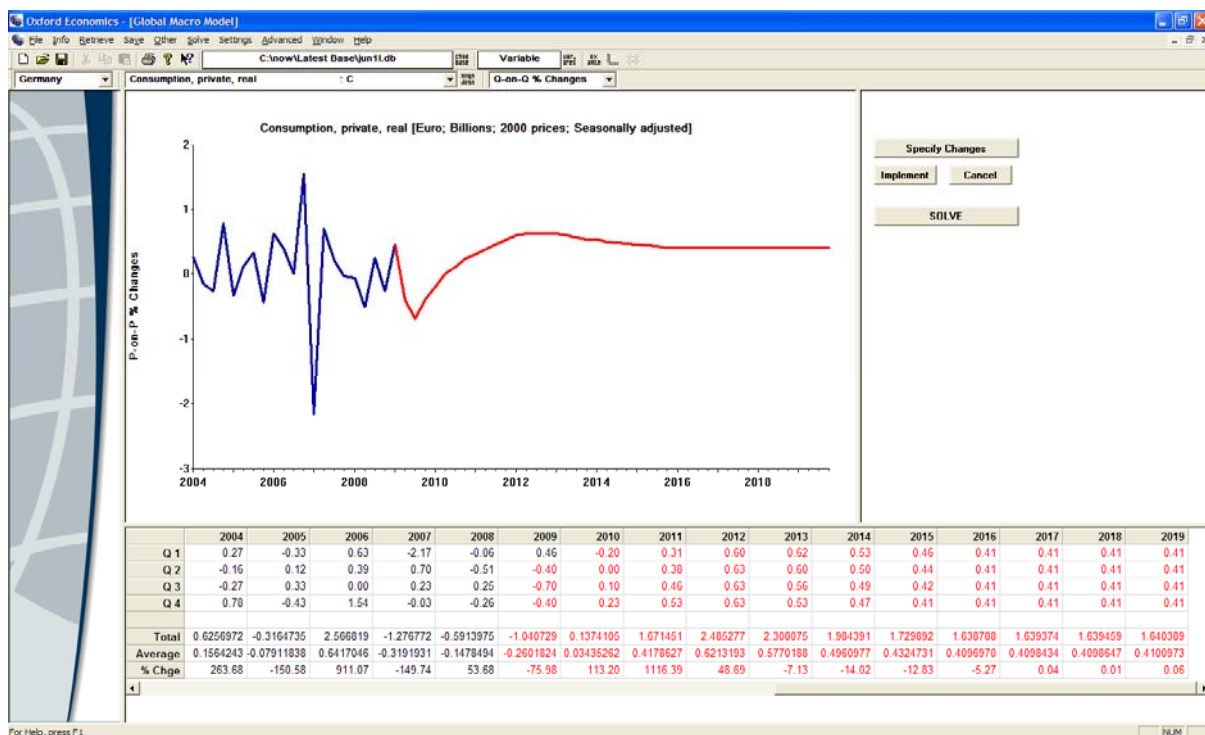
4.2 Changing variable values

If the variable you wish to change is endogenous, that is, its forecast values are determined by an equation, you have the option of changing the actual values or the residuals that are part of the calculation of those values. If you change the values directly, you will have the further option of fixing the

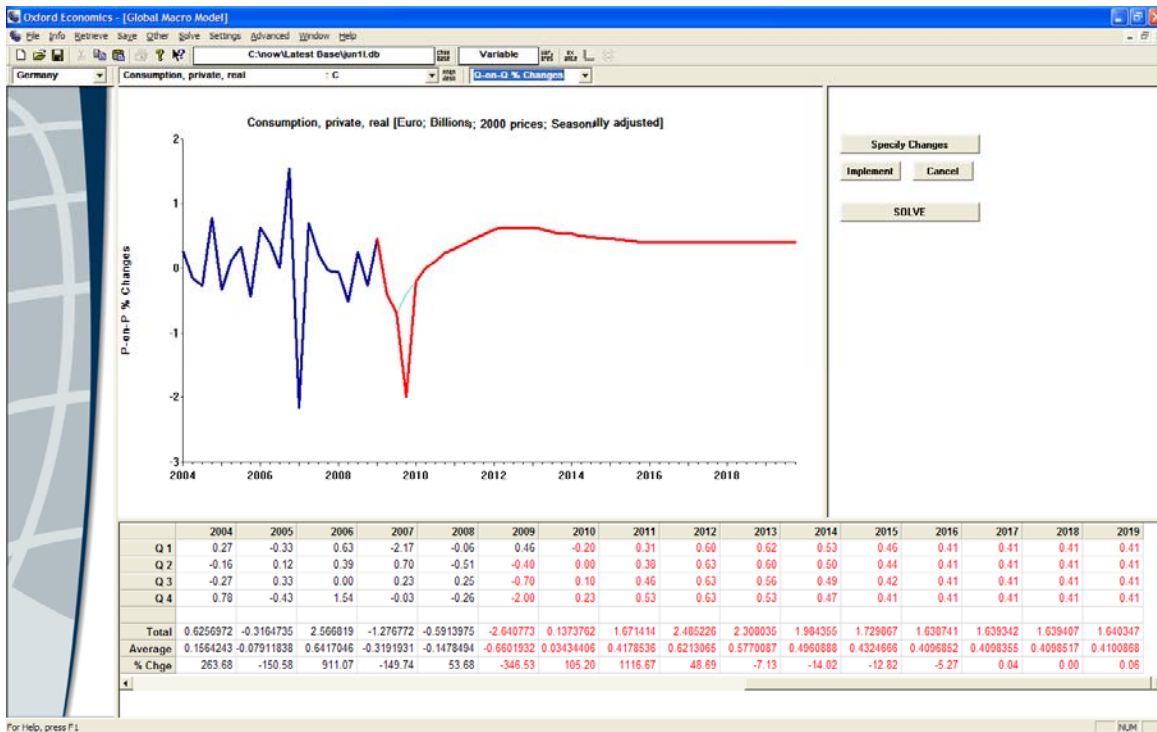
values at your preferred levels or having the program calculate the residuals that on an 'ex ante' basis are consistent with those values. Any means of changing variable values shown in the following sections will work equally well on residuals. Similarly, any means of changing values will work whether the variable is in level or transformed form.

4.2.1 Making changes directly

The simplest way to make changes is to the values of a variable is to type them directly onto the data screen. This can be done whether the variable has been transformed or not. Still using German consumption as an example, the data screen using the Q-on-Q percentage changes looks like this:

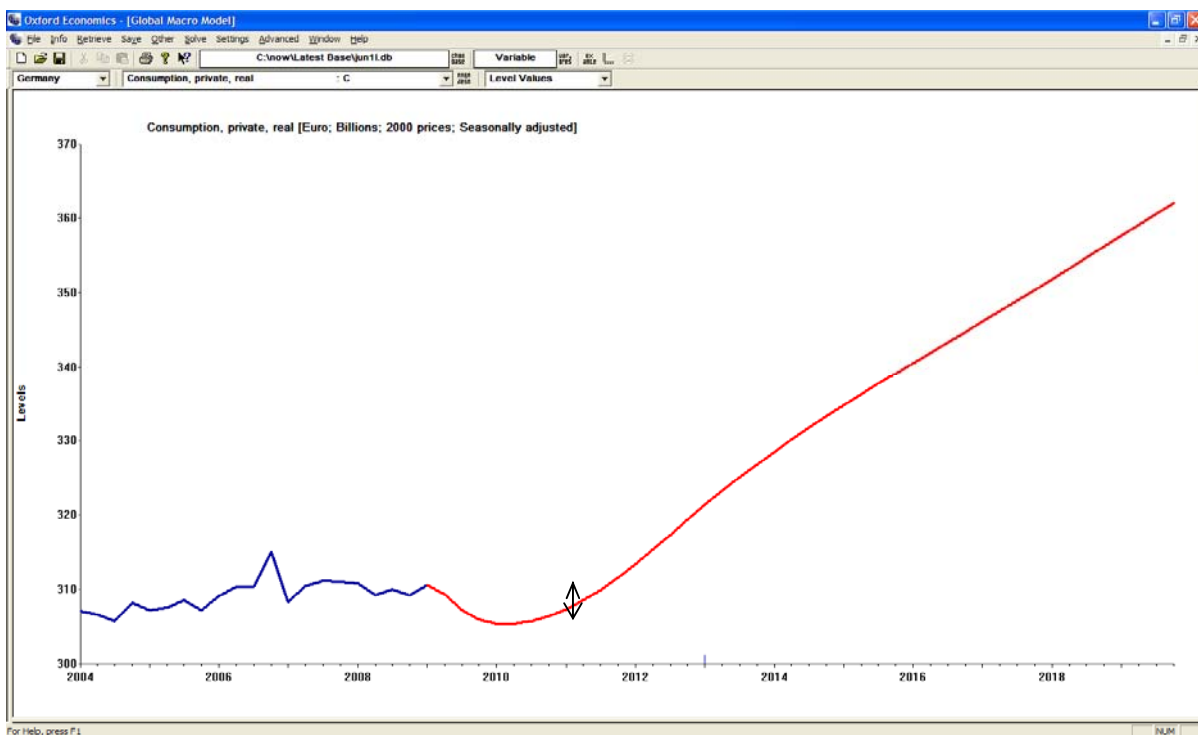


To enter a new value, double-click on the time period to be changed and enter the value desired. For example, one could click on the percentage change shown for the fourth quarter of 2009, which has a value of -0.20 in our example. Replace this with another value, say -2.0, and when you press the tab key or enter key to accept the new value, the screen will look like this.

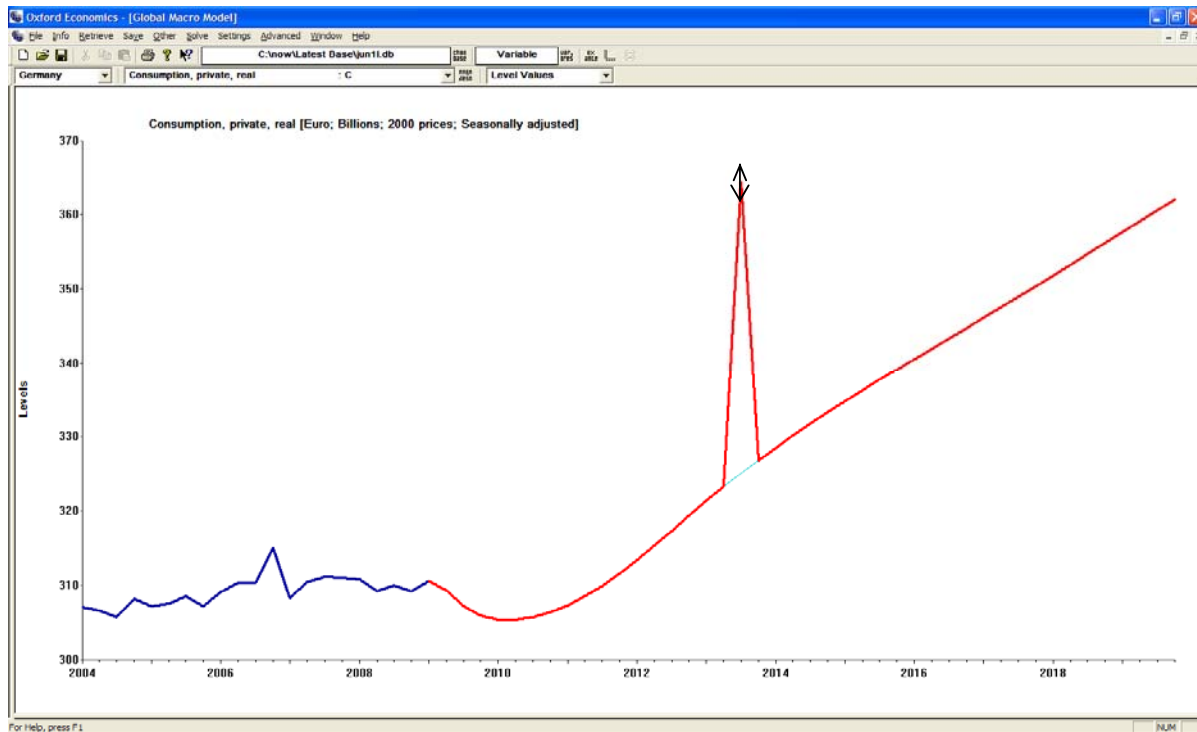


4.2.2 Making changes graphically

Variable values may also be changed graphically. To begin, click on **Cancel** to discard the changes made so far and return the series to level form. Then click on the 'graph' icon to bring up the larger graph of the series. Click on the graph, and a vertical arrow will appear on the line at the time period closest to your mouse position.

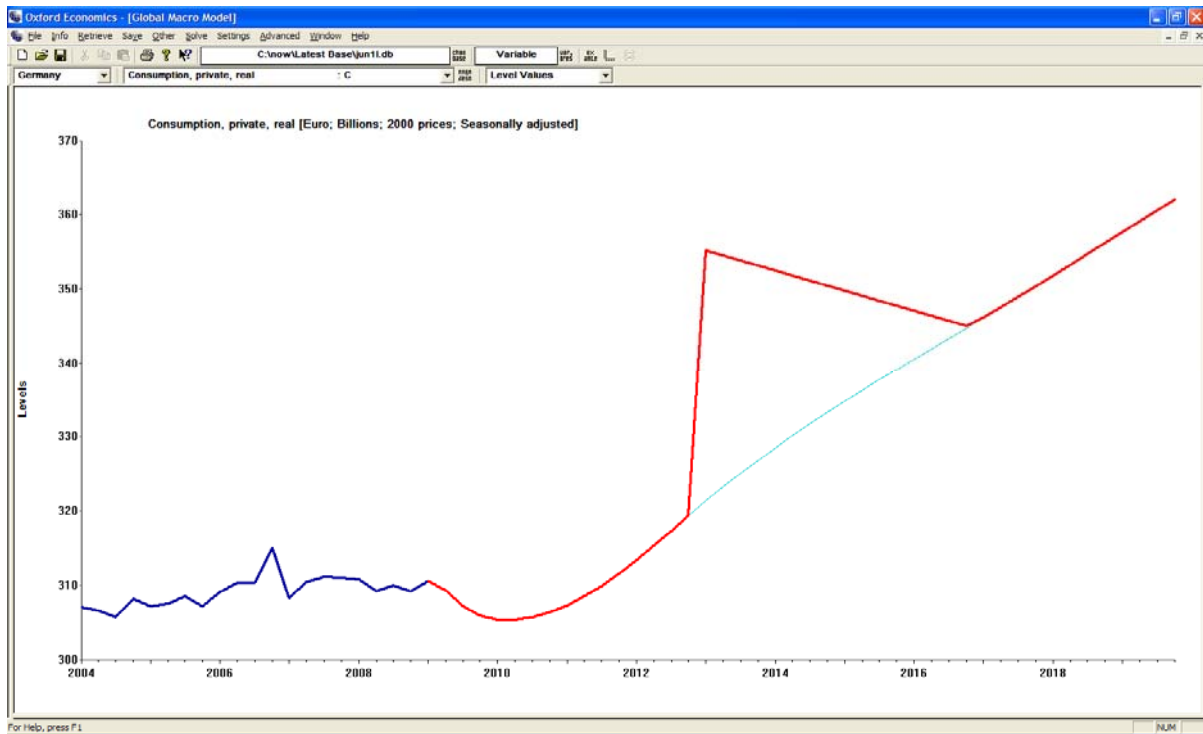


By holding the left mouse button down and moving the mouse up or down, you can pull the graph up or down to the level desired. This process can be repeated for any period on the graph. To choose another period to change, click near it or use the left or right arrow keys to move along the line to it.



For our example, we've inserted a spike in the series in 2010Q4. When you have made all the graphical adjustments you wish, click on the 'graph' icon again so that the data display is again visible. Note that the values for the periods you had pulled away from the original line have been changed, and so has the chart.

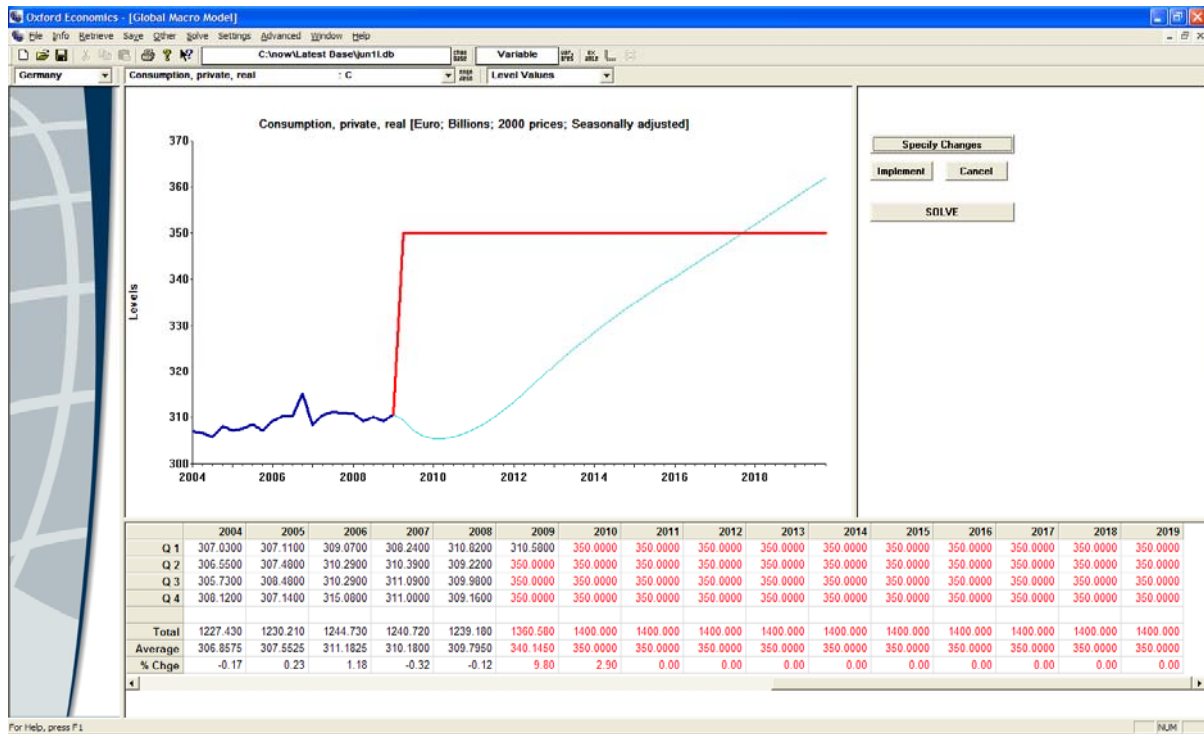
The graph can also be used to interpolate between any two points. If you are following along with us, click on the 'graph' icon and click on a point on the graph other than where you imposed the spike. Hold down the control key while pressing the left or right arrow (toward the spike), and a line will be drawn that interpolates between the first and last points. When you return to the variable data screen, you will see that the values on the line have been transferred to the variable data screen. Note: If you hold down the Alt key while pressing the left or right arrow keys, the graph will be held horizontal.



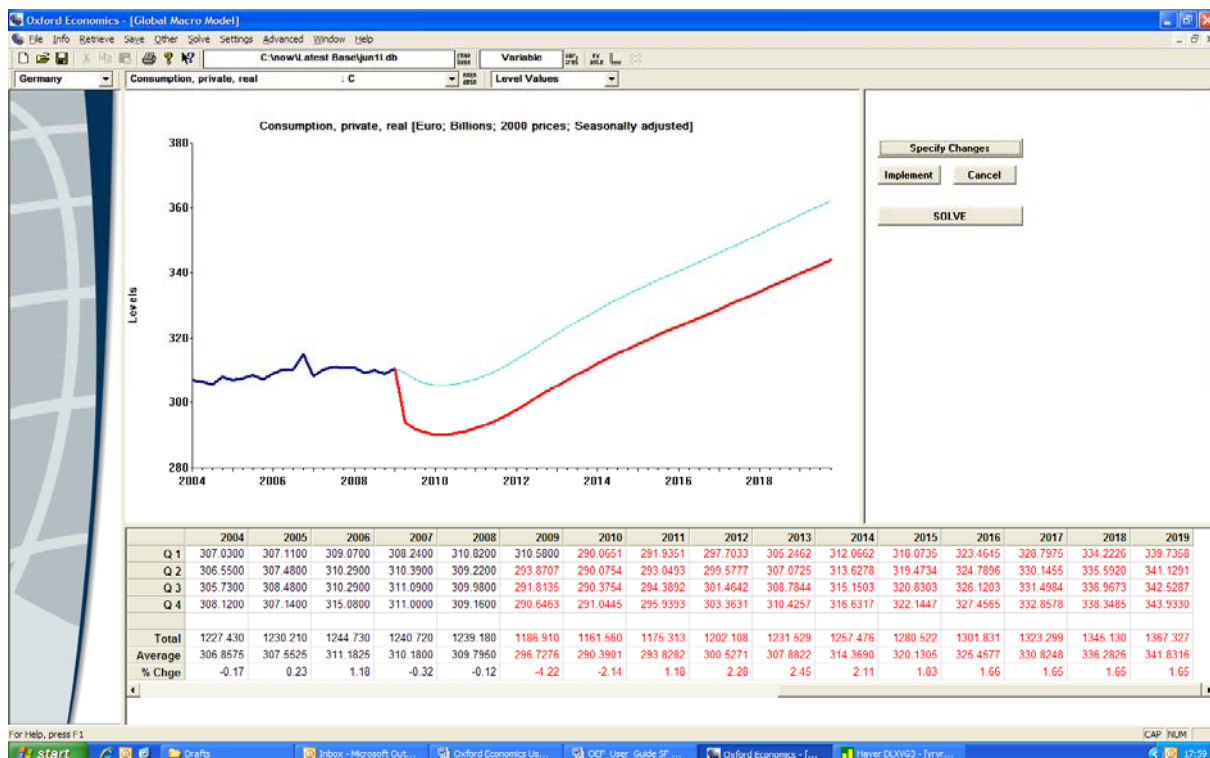
4.2.3 Specifying changes

The third way to make changes to variables is according to specified functions. To start, return to the variable display screen and cancel any changes that have been made in this example. Click on the button labeled **Specify Changes** in the body of the screen. This will bring up the dialog box:

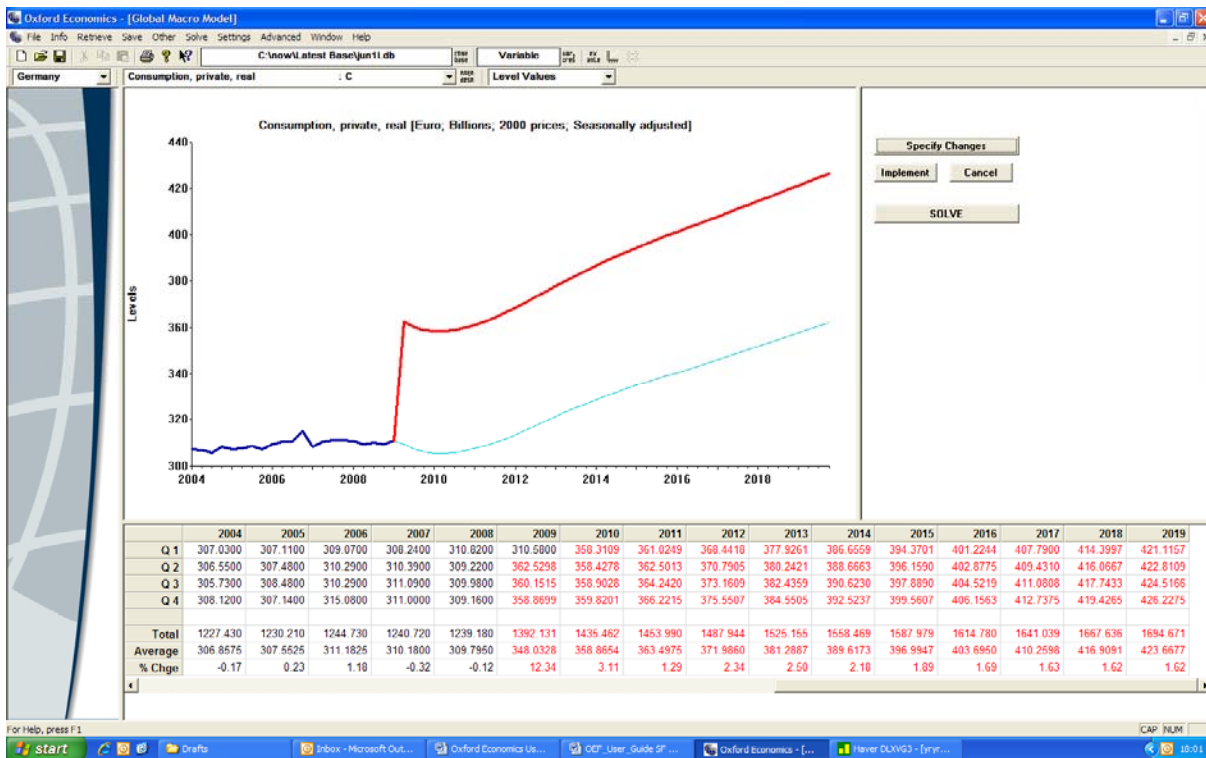
There is a date range over which the change is to take affect. Note: this range will default to the full forecast period, which may not match the period over which you wish the variable to be changed. Set the range to the period you wish. Then, anything that is typed into the white box below will be applied over that range. Say you enter the equals sign followed by the value 350. When you click on **OK** or press the enter key, the screen will look like the one on the next page:



If you just put 350 in the white box with no equals sign before it, it would add 350 to every quarter over the range specified. It is also possible to adjust a variable by a percentage, by entering for example -5%. Over the specified range, the variable will be adjusted down by 5% of its prior value. Here's what a 5% reduction over the forecast range would look like for German consumer spending.

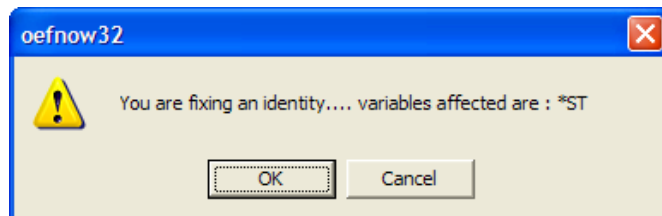


Finally, you can adjust a variable by means of an algebraic expression involving one or more other variables. As a simple example, you might want to add a fraction of GDP to the level of consumption. To do this you might enter $.01 * \text{GDP}$. You can also make a variable a function of values in another country (eg $= .05 * \text{GDP, US}$ to add 5% of each period's value for US GDP).



4.2.4 Accepting changes

Once the user has made all changes desired to the selected variable, it is necessary to save the new path by clicking on the button labeled **Implement**. If the variable is endogenous, the new values will be saved and the variable will be fixed over the range affected by the change. If the variable is one of a set of key identities, a message will appear to that effect, along with information as to which component variable or variables will be adjusted to achieve the desired path for the identity variable. For example, if a change had been made to German GDP, the following message would appear:



As mentioned, this is only the case for key identities in each country -- GDP or the unemployment rate, for example. If you change other variables that are identities, such as nominal consumption (=real quantity x price deflator/100) there will be no warning message and the identity will be broken. In general this problem is easily avoided, since the model structure is consistent and (we believe) rational, and the equations are well documented in the **EQNS.HLP files.

If the user has set values for a variable at a point in the future further than the first non-historical period, a warning will appear: Imposing only these values will leave a gap in fixes for this variable - do you wish to extend the fix back to the end of the last fix? In most cases the answer to this question is yes. Otherwise, changes to other variables may cause movement in this variable in the unfixed periods, leading to an odd jump in the series between the unfixed and fixed portions.

Once the variable change is implemented the user is free to select another variable to work on, which might be from the same or a different country.

4.2.5 Ex ante changes

If the variable being adjusted is endogenous, the user has the option of adjusting forecast residuals rather than the forecast values, as explained earlier. There is another option – the user can set a path for the endogenous variable and have the software calculate the residuals that are consistent with that path on an ex ante basis, that is, before equation interactions are considered. The equation remains active, and will react to other changes during the simulation, so the final results will very likely differ to some degree from the path set. To do this, simply click on the button labeled **ex ante** toward the right end of the toolbar. Any endogenous variable changed while this option is selected will be made to the residuals rather than the values.

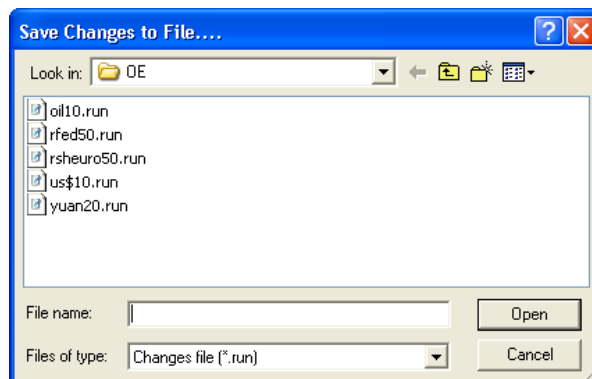
Note: once selected the option will remain in effect until the user turns it off by clicking on the ex ante button a second time. When the option is active, the button is a lighter grey than the surrounding toolbar.

4.2.6 Changing historical values

The sorts of changes we have been making to the forecast values of variables could also be made to the historical values. This might be useful if data have been revised for the most recent time period and you would like to see how this new information might affect the near term forecast. However, if you wanted to try a more ambitious experiment, say altering fiscal or monetary policy several years ago to see the outcome, simply changing the history and solving the model over the affected date range will not be effective. This is because all of the other variables are fixed at their actual historical values, so the policy change will have no effect. In this case, the user should first choose the **Other** option from the top toolbar, followed by the option **Add/Remove Fixes**. The option **Remove All Fixes** should then be checked, with the date range altered to reflect the historical period over which the counterfactual simulation is to be run. This procedure ‘activates’ the model over the past, and counterfactuals can then be conducted in the same way as simulations over the future, as described above.

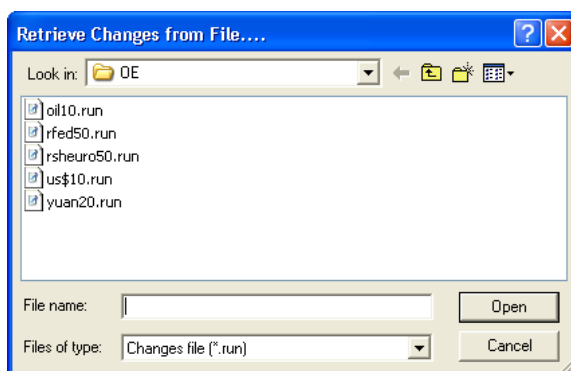
4.3 Saving and retrieving run files

At times, it may be useful to save a runfile of changes that have not yet been incorporated into a data base by solving the model. This might be the case if you're making a lot of changes and need to stop before all have been set. To save the runfile without solving, click on Save in the grey toolbar at the top of the screen. This will bring up a dialog box that lists the runfiles currently available in the directory where the OE software and databases are stored:



Provide a name for your runfile by typing in the box labeled File name. The filetype of .run will be added automatically, and the run file of all of the changes that had been implemented during the session will be saved to the OE directory.

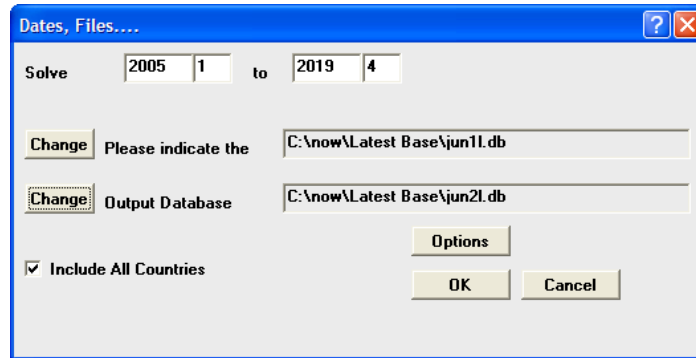
To begin work with a previously created runfile, click on Retrieve in the grey toolbar at the top of the screen. This will bring up a dialog box listing all of the available runfiles:



Click on the file you wish to start with. It will be read in, and any changes made subsequently will be added to it.

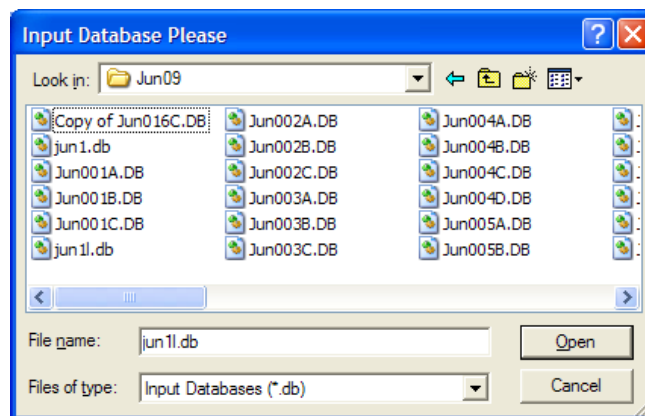
5 Solving the Model

Once you have implemented all the changes desired, click on the **SOLVE** button on the variable data screen. The following screen will appear:



At the top of the screen are date ranges for the database solution period. Although the model solution is very quick, you may want to abbreviate the solution period if you are only interested in a near-term forecast. Solving the model over some of the recent past will not affect the solution.

The input database is the starting point for the solution. If you wish to start from a different database than the default, click on the button to the left labeled Change. This will bring up a file opening screen which will display all files with extension .DB in the folder where the OXFORD ECONOMICS software is stored. Select one of them by clicking on it and then clicking on OK.



Similarly, you can change the output database by clicking on the **Change** button next to the default name. The same file opening screen will appear. You can select a database that already exists – remember that it will be overwritten by your new solution – or enter the name of a database to be created in the file name field above the list of existing databases.

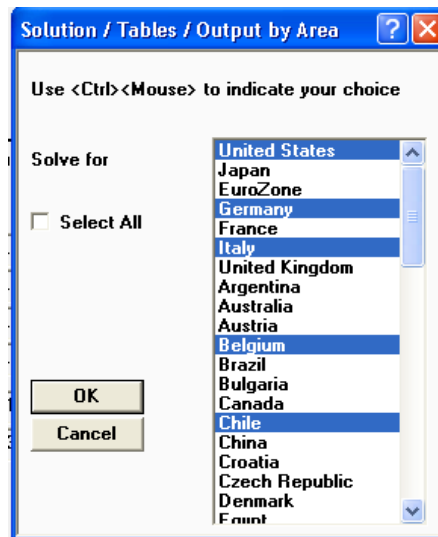
The **Options** button will bring up a dialog box that will allow you to control the solution in a number of ways.

At the top are date range entries for the database storage period. Short-term baseline databases have historical data beginning in 1980 and a forecast period of five years. However, the databases are fairly sizable and the user may wish to crop them to save disk space. If you decide to shorten the storage range, be sure that the range includes the year 1995, to supply data for lags used in the equations and to facilitate data display and table generation. Once a database has been shortened, databases that are created from it will also be short. It is not possible for the user to lengthen a database.

The box labeled **Browse Run File Before Solving** should be checked if you would like to scan the file of changes that are being implemented. **Don't Solve – Just Create Base** allows the user to add data or equations to a database without solving the model, a feature that is useful when building a new model or revising an existing one heavily, when it may be more convenient to have separate run files that must all be implemented before attempting to solve the model. **Don't Recalculate WT/WP/WC base year values** should be checked if you're doing a counterfactual historical simulation that starts before 2001. The remaining boxes are for cycling through systems of models, a highly specialized application.

Click on **OK** to return to the screen where the input and output database names were set. The box in the lower left labeled **Include All Countries** is checked by default. If you prefer to solve a subset of the model, click on the box to clear it. When all selections have been made, click on **OK**.

If you have opted for a subset of the model, a country selection screen will appear. Choose the countries to be solved by holding down the control key while selecting countries with clicks of the left mouse button. The selected countries will be highlighted, as shown below.



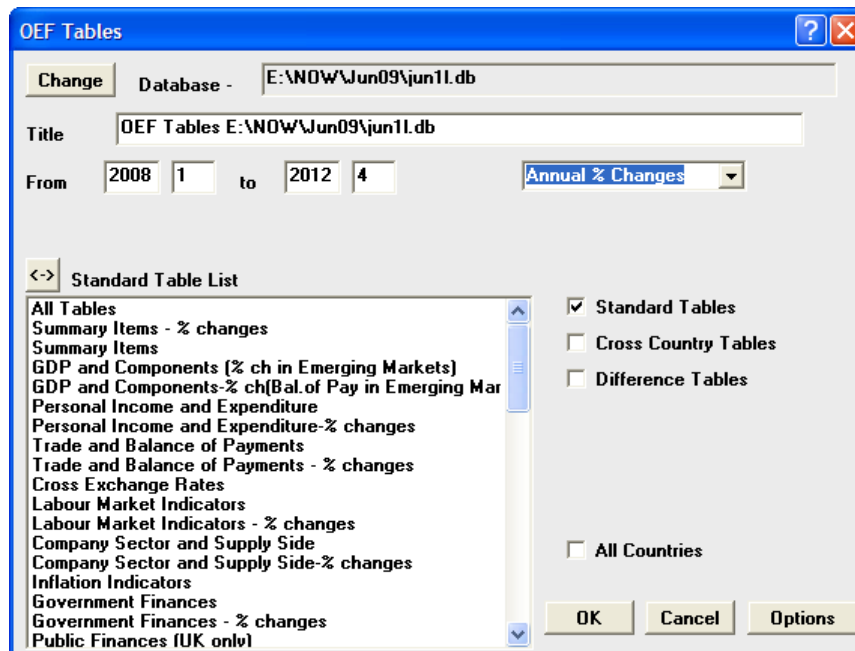
Click on **OK** to continue. The model solution will begin. While the model solves a DOS box will pop up in the applications bar at the bottom of the page. If you click on this box, it will open to show you the number of iterations that the model takes for each time period as that period is solved.

When the solution is complete, you will be returned to the variable data screen. You will then be asked if you wish to continue or update data files. Continue takes you back to the main menu screen. **Update Datafiles** saves values for variables specified by the user to *.PRN or *.CSV files, which can then be read into other packages (eg. spreadsheets). This is described further in Chapter 8.

6 Producing Tables

6.1 Oxford Economics supplied tables

To start, click on **Generate Results Tables** on the main options menu. That will bring up the following screen:

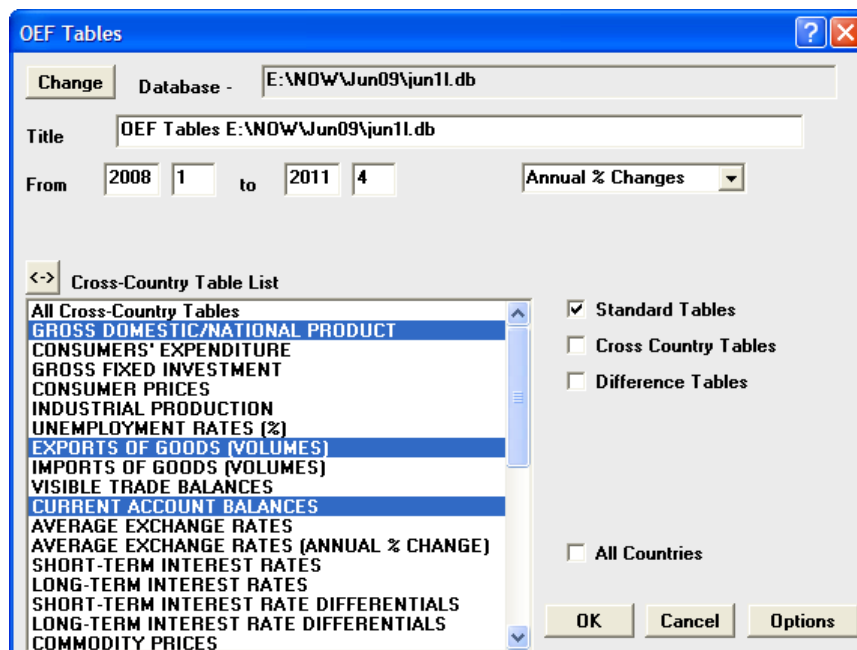


At the top of the screen is the name of a database, from which tables may be drawn. By default, this will be the name of the last Oxford Economics baseline data installed or the last database created, but any available database may be selected. To change the database names, click on the button labeled **Change** to the left of the name. This will bring up a file opening screen which will display all files with extension **.DB** in the folder where the Oxford Economics software is stored. Select one of them by clicking on it and then clicking on **OK**.

Below is a space for a title that will appear on the standard tables. Then there is a date range for the tables. It is often helpful to have a bit of historical data appear on the tables for comparison with the forecast. Set the range by clicking on the appropriate box and replacing the years and quarters as desired.

Just below, there is a toggle switch marked \leftrightarrow next to the text **Standard Table List**. In the large field below are listed the standard table titles. The Standard Tables are a set of tables that display a variety of series for one country at a time, providing an in-depth look at the forecast for any particular country or countries.

Clicking on the toggle will replace the text beside it with **Cross-Country Table List**, and the titles of the cross-country tables will be listed in the field as shown on the following page. The Cross-Country Tables, which will contain only annual data, each display a particular variable for all countries, providing an easy means of comparing the forecasts of more than one country.

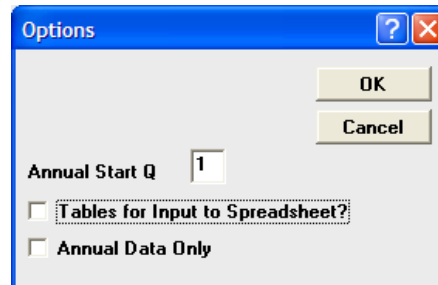


The user selects whatever tables desired from either or both lists by clicking on the choices while depressing the control key. The first selection offered on either list is all of the tables. Note: not all tables are applicable to every country. For example, in the Standard Table List, after All Tables are 16 tables common to all of the large country models, followed by names of several more tables that are specific to one of three single countries, the UK, the US and China. In order to print Standard or Cross-Country tables or both, it is necessary to click on the appropriate check box(es) to the right of the table list.

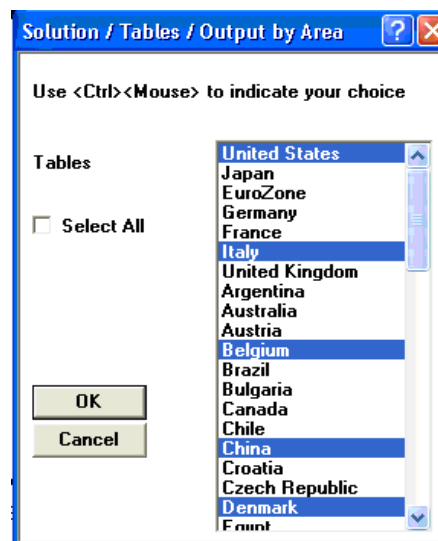
To the right of the date range is a pull down menu of possible kinds of percentage changes to be calculated if quarterly tables are to be produced. The default is for annual percentage changes, which are changes from the same period of the prior year, but you may prefer simple quarter-to-quarter percentage changes or quarter-to-quarter changes expressed at an annual rate.

Below the check boxes for Standard and Cross-Country tables is another labeled **Difference Tables**. If this box is checked, a table of the differences for key variables between two databases will be created. Note: there is one standard difference table for each country. When you select difference tables, you will be prompted with a standard windows file opening box for the name of the database to be compared against. It is possible to create Difference tables at the same time that Standard and/or Cross-Country tables are being created.

Choosing **Options** brings up the following screen.



The user may specify the **Annual start Q**, to switch between calendar years (start Q1) or fiscal years (e.g. start Q2 in the UK). As you might expect, the box labeled **Annual Data Only** will limit Standard and Difference tables to annual figures if checked. Finally, the tables format can be adjusted for reading directly into spreadsheets. When your selection is complete, click on **OK**. If you have not chosen all countries, the country selection screen will appear.



Select the countries desired by holding down the control key while selecting with the left mouse button. Then click on **OK**. A window with the tables in it will appear, as shown on the following page. This is actually a Windows browser, which will allow you to scroll through all of the tables created. The tables have also been saved in an ASCII file, with the filename the same as the main database name and an extension of **.TAB**, which can be printed later or pulled into other software, such as a word processor.

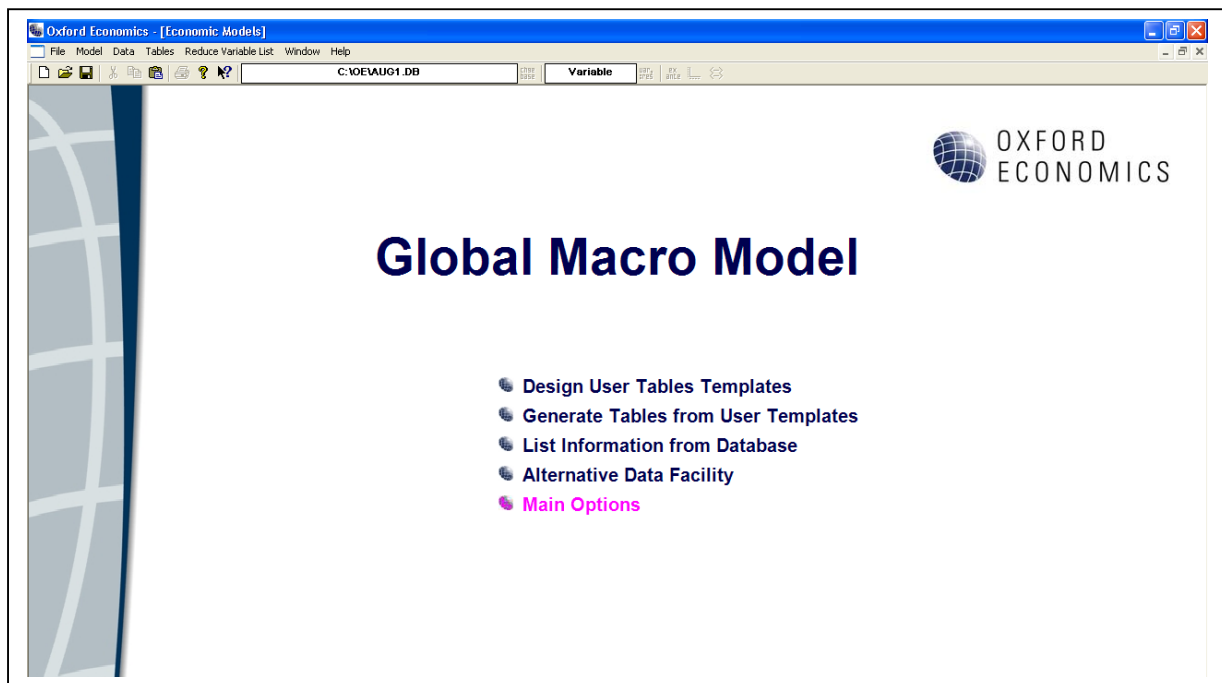
Worksheet: JANTY.TAB													
File Edit Search View Options Help													
Get Tables: C:\WORK\JANTY.TAB													
U.S.A.		TABLE 1 SUMMARY ITEMS											
QUANTITY-IN-QUANTITY ANNUALIZED PERSONAL FRANCHISE, TRUSTS (OVERSEAS) SERVICES													
CONSUMERS	REAL PERCS.	SAVINGS	REAL	INDUSTRIAL	AVGANCE	WHOLE	COMPETIT-	PRODUCED	CONSUMER	TOTAL			
EXPENDITURE	RATIO	RATIO	GDP	PRODUCTION	DEBT-FRA	EARNINGS	EXPENSE	EXPENSE	PRICES	PROFIT			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)			
UNIT													
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
YEARS BEGINNING 01													
2003	2.16	2.16	1.35	3.04	-0.02	9.99	1.06	2.12	95.04	2.00	2.16	20.96	
2004	2.14	2.14	0.97	4.48	-0.22	7.32	2.50	2.12	95.59	2.07	2.07	22.07	
2005	2.14	2.14	0.26	2.04	0.12	1.16	2.76	2.12	99.56	1.44	2.09	23.27	
2006	2.27	2.27	0.40	2.07	0.42	1.04	2.81	2.12	97.37	1.17	2.12	16.94	
2007	2.09	2.12	0.69	2.09	2.03	0.09	4.21	2.16	200.44	1.07	2.19	1.62	
2008	2.09	2.03	0.16	2.27	2.16	0.09	9.44	2.14	92.02	0.19	2.07	20.19	
2009	2.19	2.17	2.12	2.16	0.07	1.09	0.62	2.16	99.99	0.67	2.10	21.34	
2000													
1	1.67	1.77	1.06	1.53	-0.06	5.03	3.76	-0.15	97.93	0.16	1.03	-1.46	
2	1.00	0.10	1.16	0.11	-0.14	0.13	0.10	1.19	94.19	-1.12	0.05	19.74	
3	0.05	0.14	1.19	0.78	0.10	0.13	0.02	0.05	91.97	2.44	1.40	51.00	
4	2.16	2.17	2.14	0.29	0.00	0.07	0.10	0.10	93.09	2.00	2.00	19.26	
2006													
1	0.14	2.04	2.10	0.00	0.05	0.07	1.70	0.10	97.74	2.12	2.12	22.10	
2	0.17	0.00	0.12	0.10	0.00	0.07	0.11	0.10	97.04	0.17	0.12	1.40	
111	0.14	2.00	0.00	0.00	2.10	0.07	2.10	0.10	99.02	0.16	0.10	21.70	
2007	0.16	2.00	0.07	0.10	0.00	0.07	0.10	0.10	96.78	0.10	0.10	21.70	
2008													
1	0.00	2.19	0.10	0.00	0.76	0.00	2.16	0.10	95.00	-0.10	0.10	10.11	
2	0.10	0.07	0.00	0.10	0.10	0.10	0.10	0.10	90.00	0.10	0.10	10.10	
111	0.16	2.04	0.10	0.10	0.10	0.10	0.10	0.10	91.71	0.16	0.10	10.11	
2009	0.16	2.10	0.10	0.10	0.10	0.10	0.10	0.10	92.04	0.16	0.10	10.11	
2006													
1	2.17	0.01	0.76	0.04	2.14	2.10	0.01	2.10	92.05	2.02	2.10	-0.69	
2	0.07	2.10	0.00	0.00	2.10	0.07	0.10	2.14	96.00	2.00	2.14	24.61	
111	0.06	0.76	0.00	0.77	0.10	0.00	0.10	0.10	97.14	0.10	0.10	0.94	
2007	2.10	2.10	0.10	0.10	2.10	0.00	0.00	2.10	97.14	0.10	2.10	10.10	
2007													
1	2.19	0.10	0.0										

When you have finished viewing the tables, click on **File** and **Exit** from the toolbar or the **X** button in the upper right hand corner to close the browser window.

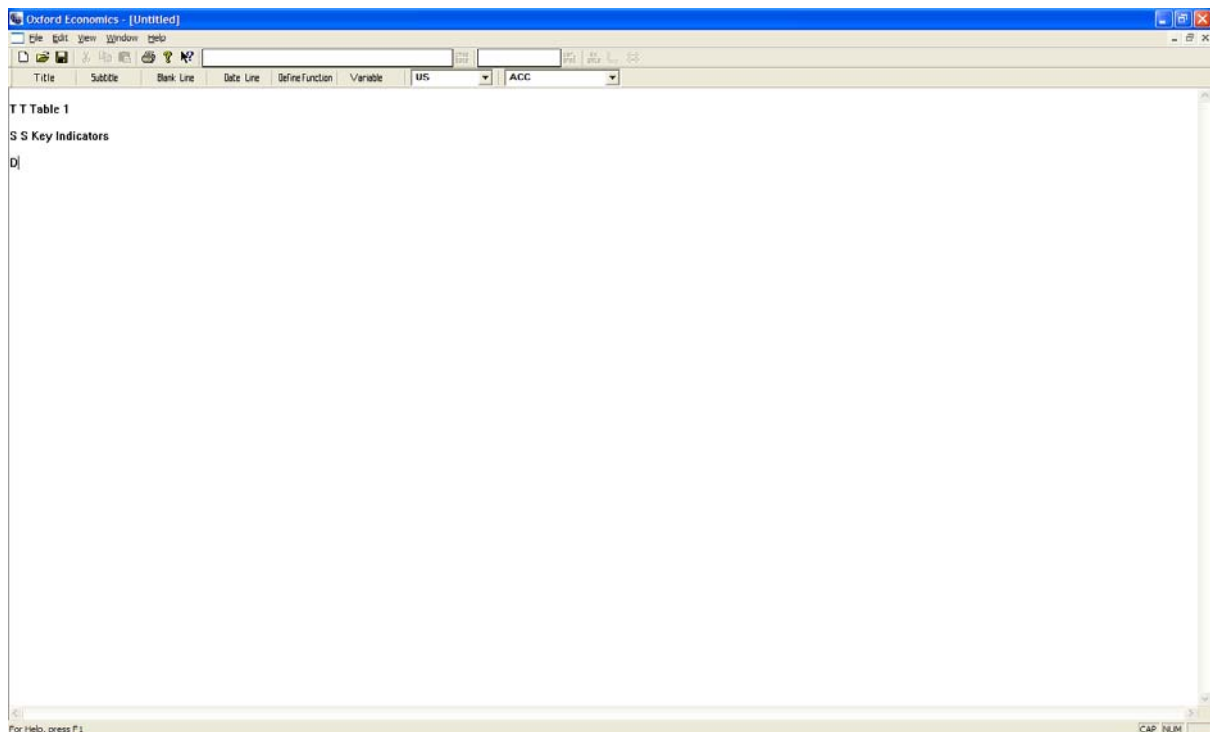
6.2 User Tables

6.2.1 Setting up a table template

As well as printing standard tables provided by Oxford Economics, users can also print off tables designed themselves. These tables are controlled by the information in template files, which the user can set up to include specific table titles, subtitles, and data series and series descriptions to be included. To create a template, choose **Advanced Options** in the main menu screen and then select **Design User-Tables** from the new list.



The following screen will then appear. Clicking on the boxes labelled Title or Subtitle will bring up a dialog box that requests the user to type in a text string that will appear in the table as a title (centered on the page) or a subtitle (printed flush to the left). Clicking on Blank Line will insert a space into the table, while Date Line will provide for dates to appear across the page.



Define Function is used if it is desirable to print data in a table that is not stored in the database but that can be calculated from series that are in the database. The user types a mnemonic into the small box and the calculation into the larger box, as shown below in the example to calculate nominal consumption's share of nominal GDP.

Functions for User Table Templates

Mnemonic for Variable to be Created
(max 15 characters):

Function to be used (no LHS or equals sign):

OK Cancel

Clicking on **Variable** brings up the following dialog box, to collect information about the next line item to be included in the table. Type the mnemonic in the first box. There are pull-down lists of countries and mnemonics available to help the user find the mnemonics, but the information must still be typed into the appropriate boxes. If the table is to include data from a single country, then the **Sector/Country** box may be left blank (the country will be selected when the table is generated). If the table is to include data from more than one country, then the **Sector/Country** box must be filled in. The variable mnemonic must be either in the database or determined via the **Define Function** box.

Information for Variable Line in Table

Variable Mnemonic:

Sector/Country:

Number of Decimal:

Data Type:

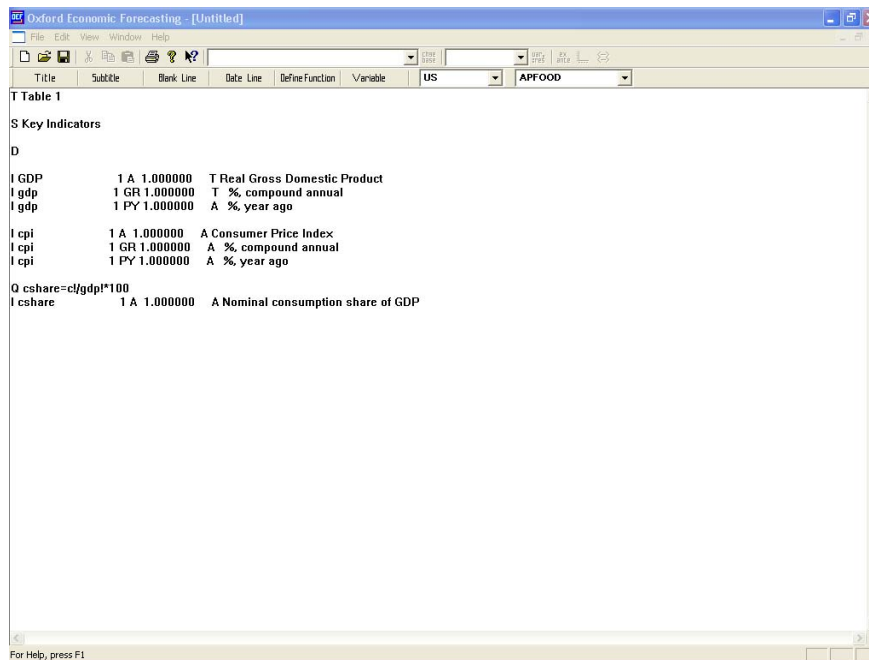
Scale Factor:

Annual Data Type:

Text Description for:

OK Cancel

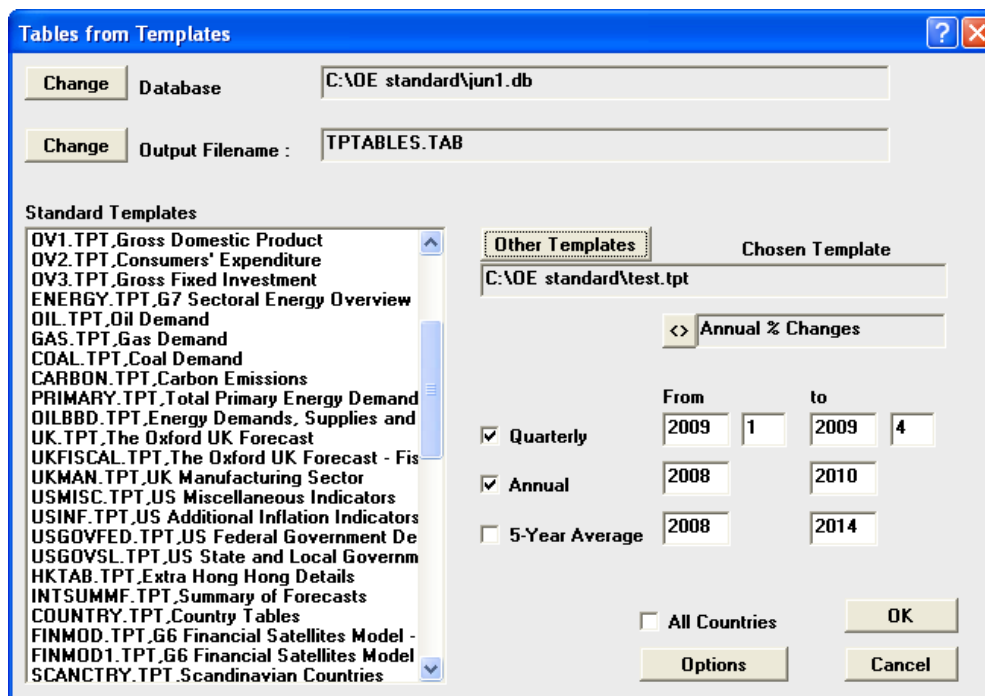
Number of Decimal specifies the number of decimal places to be printed, and **Data Type** specifies the transformation of the data to be printed: level, difference, annual difference, percentage change, annual percentage change or compound annual growth rate. The **Scale Factor** comes into play if the data to be printed are very large or very small – they will display better after scaling. Annual Data Type specifies the calculation of annual data: averaging, summing, or using the fourth quarter value. The **Text Description** will be printed to the left of the data. A sample template is shown below:



Click on File and Save to save the template. The file extension must be .TPT. Return to the main menu by clicking on the X to the far right of the grey toolbar twice. Note: The TPT file editor may be used to make changes to an existing TPT file. Click on File and Open to find the appropriate TPT file, position the cursor to the point at which changes are to be made, and proceed as in the initial creation of the file. It is also possible to edit the files in any editor (such as Notepad), but using the TPT file editor provided eliminates the potential for errors.

6.2.2 Generating a table from a user template

To create a table from the template, choose **Generate Tables from User Templates** from the Advanced Options menu



The database from which the table is to be created is chosen as well as a name for the ascii file that will save the table. The default for the table file is TPTABLES.TAB. Click on **change** to choose an alternative filename.

The box on the left headed Standard Templates gives a selection of pre-formatted tables which appear in Oxford Economics documents. The box Other Templates on the right-hand side allows the user to update a template table of his own design. Clicking on Other Templates gives a menu of all the .TPT files available in the user's working directory, from which the required table can be selected.

Quarterly, annual and 5-year average data are selected by checking the boxes in the middle of the screen, while the user can choose the date range in the boxes alongside. Options allows users to alter the start quarter for actual calculations (e.g. calendar vs. fiscal years) and to calculate differences or percentage differences between two databases. In addition, the table output can be controlled by altering the number of significant digits to be printed, the line length and the number of lines per page. If both annual and quarterly date ranges have been set, the user can choose to have the annual data appear to the left of the quarterly data (the default is for the quarterly data to appear first). Finally, the user can choose "Comma/Quote Delimited Output" for easier importing of the resulting file into a spreadsheet.

Having selected the user-defined tables to be updated click OK and specify the countries required as with Oxford Economics supplied tables. The resulting table will be displayed in the Windows browser, as described in the previous section. The tables can be sent to a printer or pulled into other software, such as a word processor.

The template shown as an example on the previous page was saved to a file called TEST.TPT. In the example above, this template was chosen from the Other Templates selection, quarterly data for 2009 and annual data for 2008-2010 were selected. On the country selection screen, the US and Germany were selected. The resulting table is shown below.

The screenshot shows a WordPad window titled 'IPTABLES.TAB - WordPad' with the following content:

JUN1.DB/ TEST.TPT United States 30-07-2009 at 2:30 pm

Table 1
(Annual % changes used, except where otherwise stated)

Key Indicators

	2009 1	2009 2	2009 3	2009 4	2008	2009	2010
Real Gross Domestic Product	2838.4	2827.0	2819.9	2821.7	11652.0	11307.0	11448.1
% , compound annual	-2.5	-3.6	-3.7	-2.0	1.1	-3.0	1.2
% , year ago	-2.5	-3.6	-3.7	-2.0	1.1	-3.0	1.2
Consumer Price Index	212.6	213.4	214.1	214.7	215.2	213.7	217.5
% , compound annual	-0.2	-0.9	-2.0	0.3	3.8	-0.7	1.8
% , year ago	-0.2	-0.9	-2.0	0.3	3.8	-0.7	1.8
Nominal consumption share of GDP	70.6	71.0	71.0	71.1	70.5	70.9	71.1

JUN1.DB/ TEST.TPT Germany 30-07-2009 at 2:30 pm

Table 1
(Annual % changes used, except where otherwise stated)

Key Indicators

	2009 1	2009 2	2009 3	2009 4	2008	2009	2010
Real Gross Domestic Product	2838.4	2827.0	2819.9	2821.7	11652.0	11307.0	11448.1
% , compound annual	-2.5	-3.6	-3.7	-2.0	1.1	-3.0	1.2
% , year ago	-2.5	-3.6	-3.7	-2.0	1.1	-3.0	1.2
Consumer Price Index	212.6	213.4	214.1	214.7	215.2	213.7	217.5
% , compound annual	-0.2	-0.9	-2.0	0.3	3.8	-0.7	1.8
% , year ago	-0.2	-0.9	-2.0	0.3	3.8	-0.7	1.8
Nominal consumption share of GDP	70.6	71.0	71.0	71.1	70.5	70.9	71.1

Note: The Standard Templates include templates for the Cross-Country tables described in the previous section. They are labelled OV1.TPT, OV2.TPT, etc. These templates can be used, as shown in the example below, to produce those Cross-Country tables on a quarterly basis. If you wish to create these Cross-Country tables in this way, do not select **All Countries**, even though data from all countries will be included. Rather, on the country selection screen, click on a single representative country to generate one copy of the table(s) selected. If you select **All Countries**, you will generate one copy of the selected tables for each of the individual countries in the model. While this will do no harm, the listing generated will be quite long and the process could take quite some time.

TP1AB15.1AB WordPad

File Edit View Insert Format Help

JUN1.DB/ TEST.TPT United States 30-07-2009 at 2:39 pm

OVERVIEW TABLE 1

(Annual % changes used, except where otherwise stated)

GROSS DOMESTIC PRODUCT
(% CHANGE ON PREVIOUS YEAR)

	2009 1	2009 2	2009 3	2009 4
North America				
United States	-2.5	-3.6	-3.7	-2.0
Canada	-2.1	-2.6	-3.1	-2.2
Mexico	-8.6	-9.4	-7.0	-1.2
Europe				
Euro Zone	-4.8	-5.2	-5.3	-3.7
Germany	-6.9	-6.8	-6.6	-4.6
France	-3.2	-3.7	-3.9	-2.6
Italy	-5.9	-6.0	-5.4	-3.3
Spain	-3.0	-4.1	-4.4	-3.7
Netherlands	-4.5	-5.6	-5.7	-4.6
Belgium	-3.0	-4.2	-4.5	-2.9
Austria	-2.9	-4.2	-4.5	-4.2
Finland	-6.0	-5.9	-5.1	-3.0
Ireland	-10.4	-9.4	-10.0	-4.0
Portugal	-3.0	-4.0	-4.1	-2.7
Greece	0.3	-1.6	-2.2	-2.5
EU15	-4.8	-5.2	-5.2	-3.5
UK	-4.1	-4.7	-4.5	-3.1
Sweden	-6.4	-6.5	-5.9	-0.6
Denmark	-3.6	-4.3	-3.5	-1.3

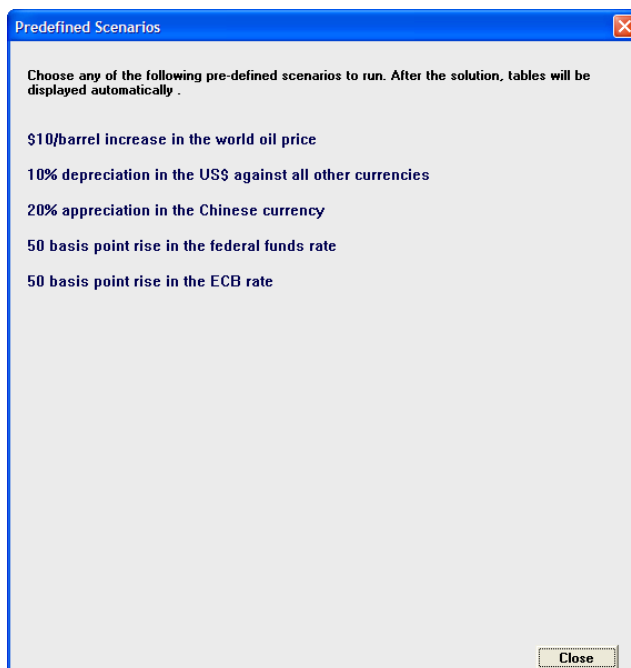
For Help, press F1

start ODI User... Oxford Eco... Microsoft Of... Command P... Oxford Eco... TPTABLES.T...

2:39 PM

7 Pre-Defined Scenarios

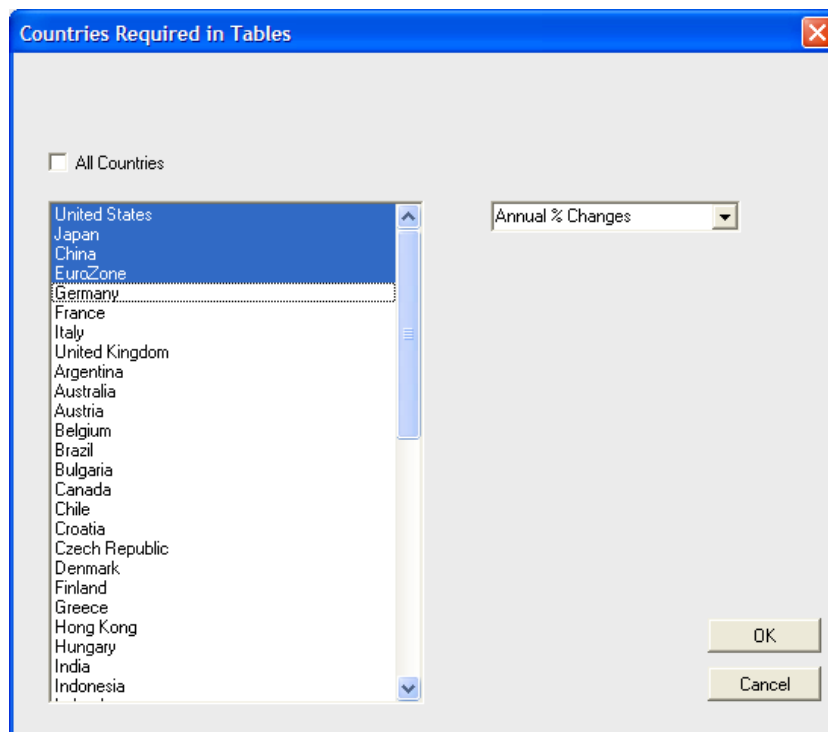
There are some pre defined scenarios in the model where changes to the model have been already made and will run automatically once selected. For example a shock such as an increase in the world oil price can be applied to the model before tables are used to examine the impact of the shock on different countries and different variables. Click into the **Pre-defined Scenarios** option on the main menu and the screen below will appear.



There currently are 5 pre-defined scenarios-

1. The world oil price variable WPO is raised by \$10/barrel from 2010 Q1 to 2018 Q4.
2. A 10% US dollar devaluation is imposed from 2010 Q1 to 2018 Q4.
3. A 20% revaluation to the Chinese yuan against the US\$, which assumes that all other Asian currencies follow suit. This is imposed from 2010 Q1 to 2018 Q4.
4. A 50 basis points increase in the US federal funds rate from 2010 Q1 to 2010 Q4.
5. A 50 basis points increase in the ECB Interest Rate from 2010 Q1 to 2010 Q4.

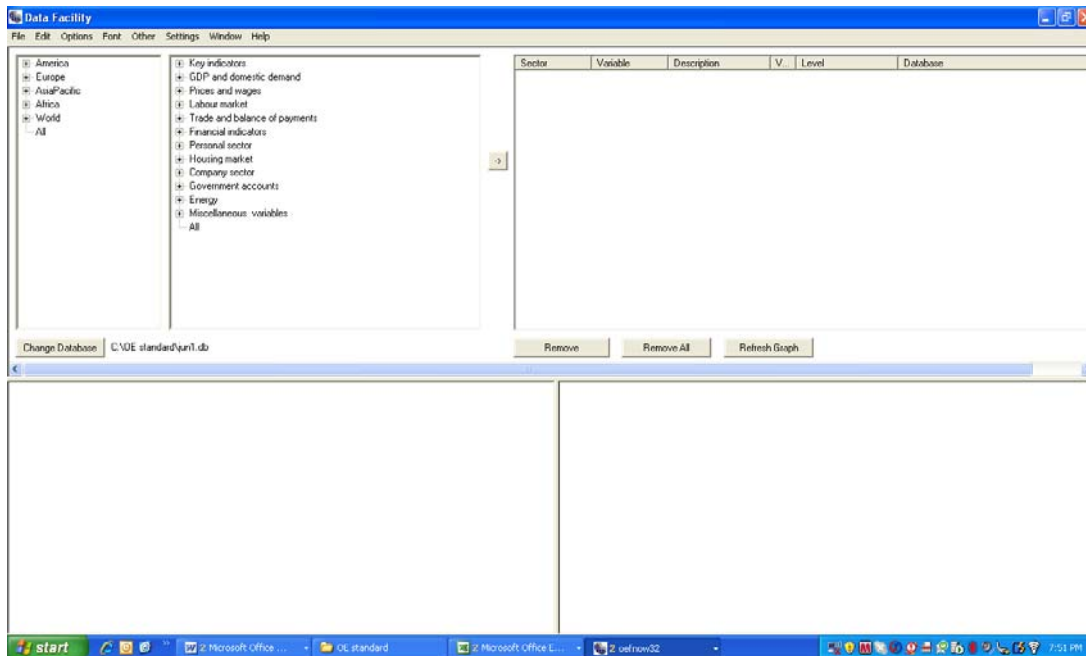
To run the oil shock, click on the option **\$10/barrel increase in the world oil price**. Choose a name for the output file and save it and click **ok**. The screen on the next page will pop up. If you wish to look at results for all countries, tick the box at the top which says all countries. Otherwise select the countries you wish to include individually.



A CSV workbook will be created automatically and will show standard Oxford Economics created tables, as discussed in chapter 6. For each country selected there will be two tables of summary items. After all the summary items tables there will be a list of difference tables, one for each country and showing the differences to key variables in the model from before and after the oil price shock.

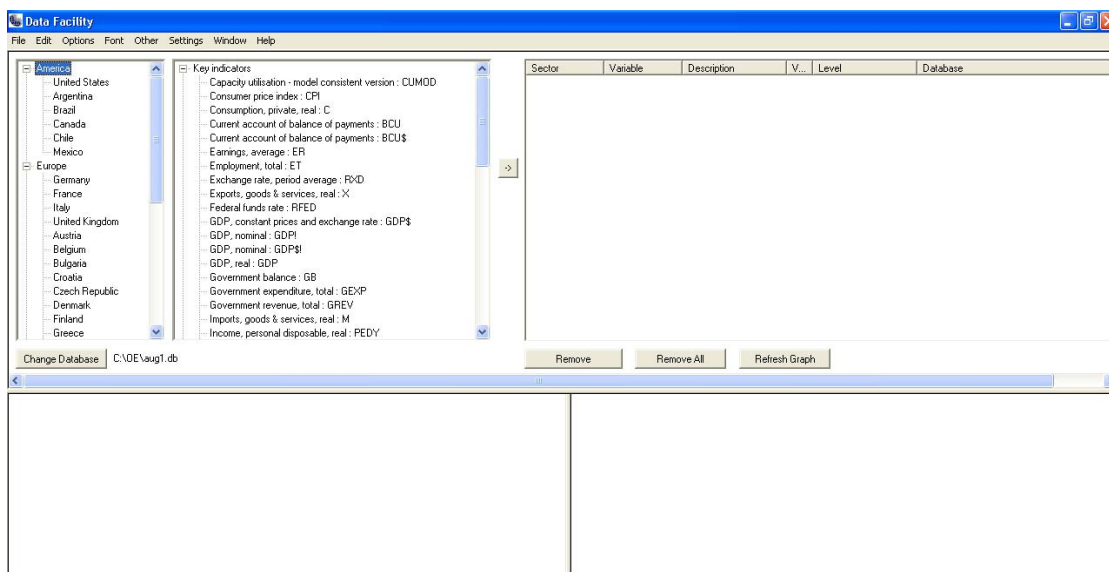
8 View and Download Data

This section provides a means of collecting data of interest from one or more databases, displaying it in either level or transformed form and downloading it to files that are accessible by other software packages. To start, click on View and Download data from the main menu. That will bring up this screen:

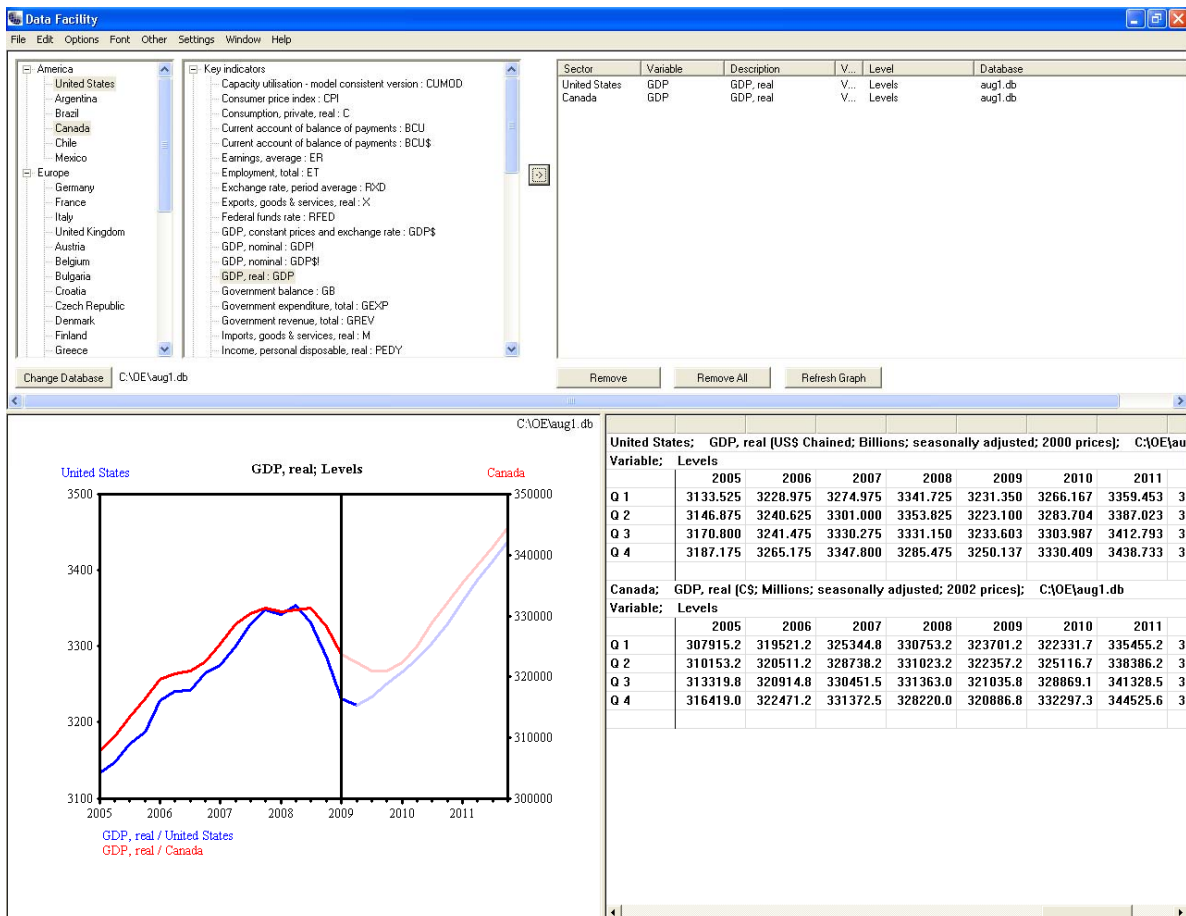


8.1 Displaying data

The screen is divided into four roughly equal sections. In the upper left corner are two boxes. The leftmost contains a list of regions and the one to the right a list of economic sectors. Beside each entry in these lists is a small box containing a plus sign. Clicking on the plus sign will open up sublists for each region and sector, as shown below.



Where the lists have been expanded, the plus sign has been replaced with a minus sign. Clicking on the minus sign next to a region or sector name will collapse that particular list again. You may select one or more countries from one or more regions by clicking on them while holding down the control key. Then you would select one or more variables from one or more sectors in the same manner. When the series have all been identified, click on the right arrow button in the middle of the top half of the screen. We chose real GDP from the US and Canada.



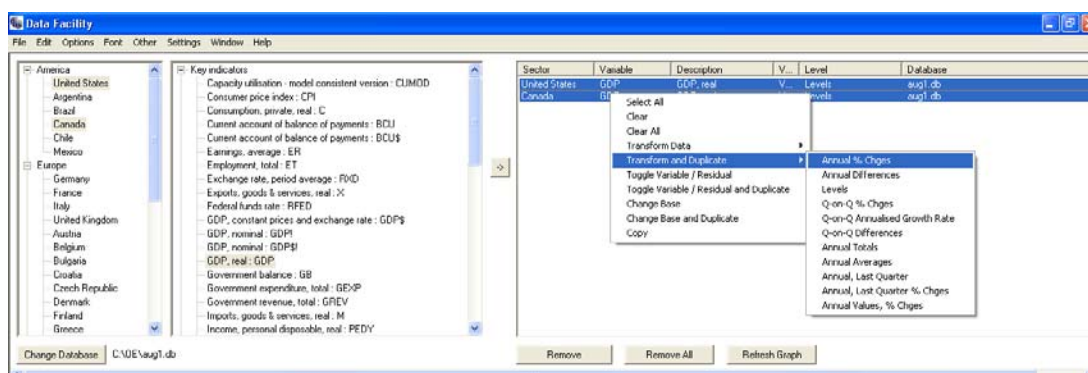
Now there is information in the other three sectors of the screen. In the top right block, there is information on the variables that were selected, including the country, the variable mnemonics, the variable descriptions, the transformation if any, and the database from which the variables were drawn. In the bottom left block is a chart of the variables, with the historical data distinguished from forecast both by means of a vertical line and the intensity of the lines. The magnitude of the two variables are very different, with the levels of Canadian data much larger than US GDP because GDP is reported in millions in Canada but billions in the US. Click on the F5 function key to cause the graph to switch to different scales on the two vertical axes. In the lower right hand block the data themselves are displayed, in spreadsheet form. The scroll bar beneath the data listing can be used to display earlier data or data further into the forecast period.

You can change the periods displayed in the chart by clicking on it and using the insert and delete keys to lengthen or shorten the periods shown, while the left and right arrows can be used to move the display back through history or forward to the end of the forecast period. Similarly, you can move the data display in the lower right block forward and back through time by means of the scroll bar beneath it.

8.2 Defining functions – to be added

8.3 Transforming data

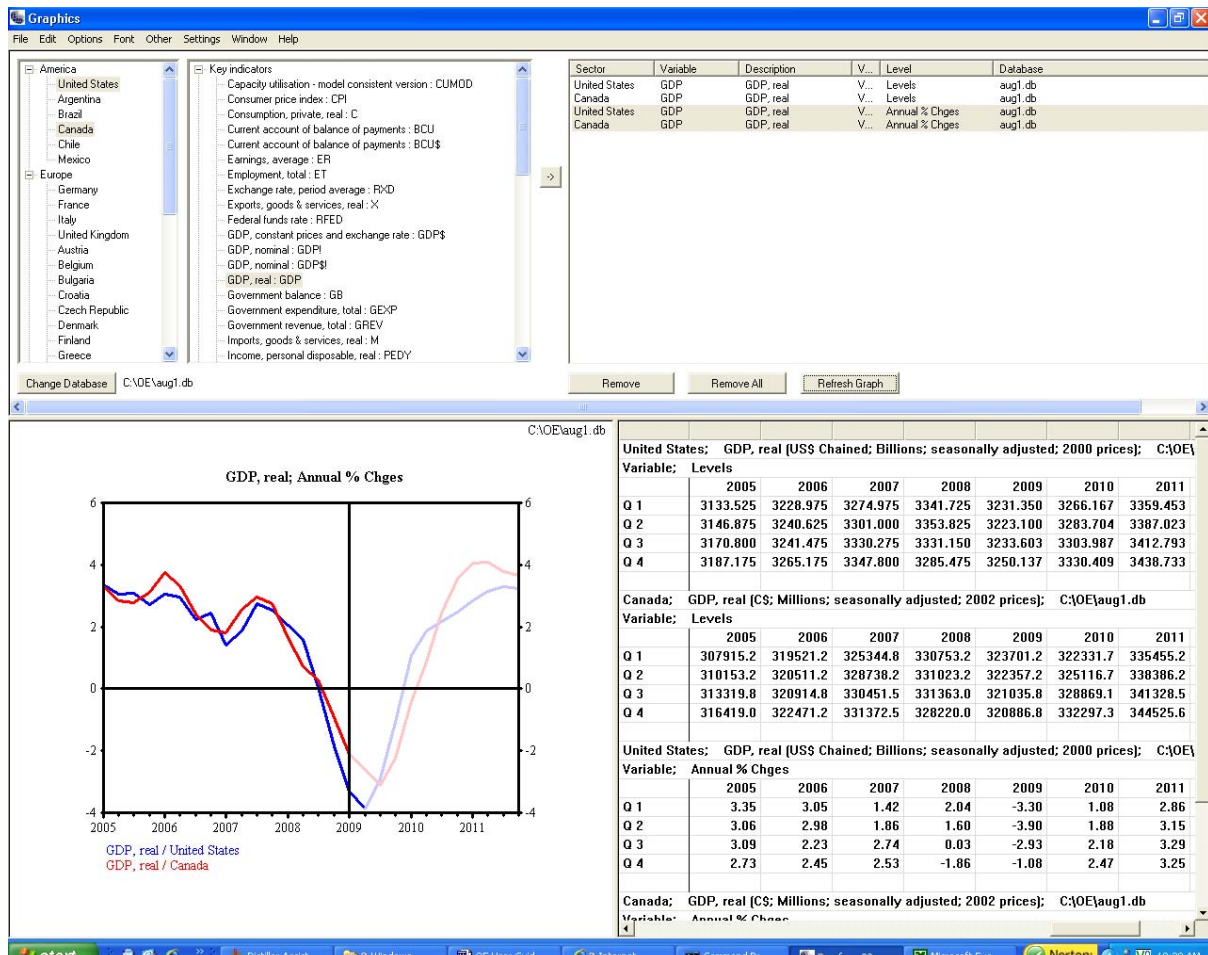
Our example in Section 8.1 displayed the data in level form. However, it is possible to transform the data in a number of ways, and to bring in the same series from a different database without returning to the data lists. To do this, in the upper right-hand box, highlight the series to be transformed or to be pulled from another base. Right click on the one of the highlighted series, and a box of options will appear:



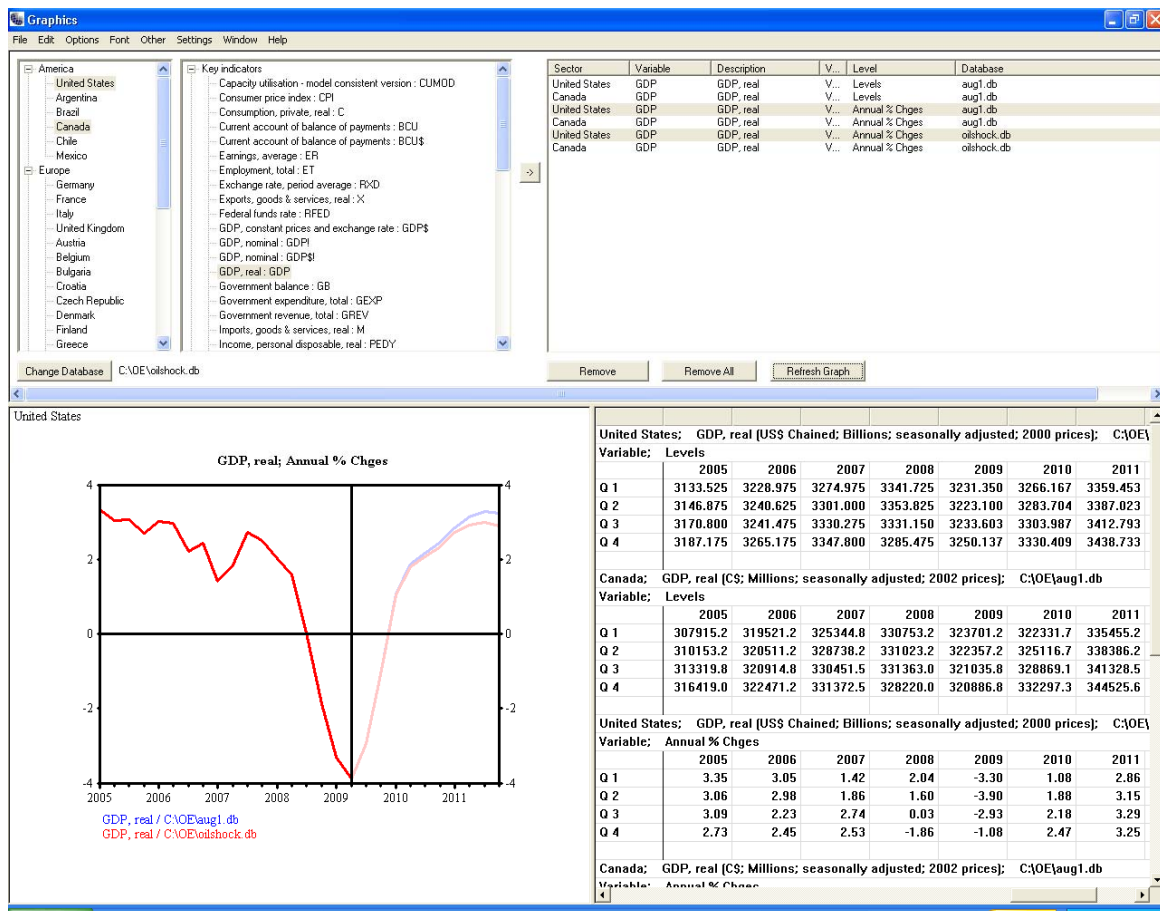
The first few options will allow you to select all the series on the list or clear all or selected series from the list. The fourth is to transform data series, which will replace the series highlighted with the desired transformation of the same series, while the fourth, to transform and duplicate leaves the original series in place but adds the transformed series to the list. In the example above, we've opted to transform the data as additional series. The transformations available are: Annual Percentage Changes and Annual Differences (both of which produce series of quarterly changes calculated against the same period of the previous year), Levels, Q-on-Q Percentage Changes, Q-on-Q Annualized Growth Rates and Q-on-Q Differences (the Q-on-Q transformations also provide quarterly values, but the calculations are against the previous quarter) and then a number of ways of calculating annual values: as Annual Totals, Annual Averages, Last Quarter, Percentage Changes between 4th quarters, and Percentage Changes of Annual Values.

Going back to our example, we chose Annual % Chges, which added two items to our list of series, the percentages changes calculated against the year-earlier quarter in US and Canadian GDP. The data have appeared automatically in the spreadsheet corner of the page, but the graph will not change until

you highlight the new series and click the Refresh Graph button at the bottom of the series list box. The screen then appears like the one below.



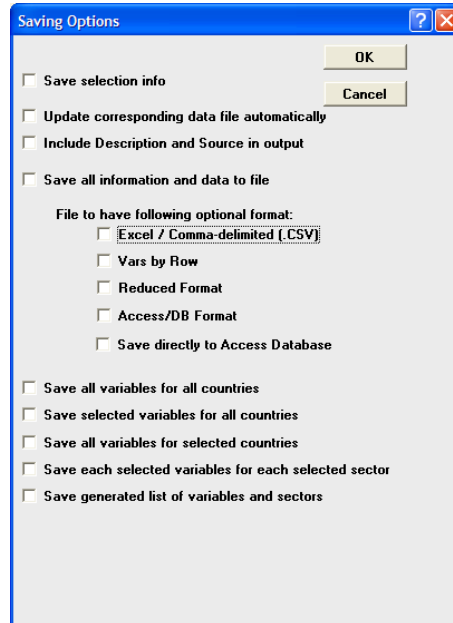
In addition to transforming series, there are options to show the equation residuals for the selected variables, again either replacing the series data or adding additional items to the list. Most users are more likely to want to pull in data from a different database. As shown in the screenshot on the previous page, these options are also provided. With the annual percentage change variables still highlighted, we right-click on one of them and selected Change Base and Duplicate. This brought up a list of available databases. We selected on, an oil shock scenario, and two new lines were added to our list, for the annual percentage changes in GDP for the US and Canada but drawn from the second base. The data appear automatically in the spreadsheet part of the screen, but the chart won't change until Refresh Graph button is pushed. We selected the percentage changes for the US and Canada (by selecting while holding down the control key) and refreshed the graph. The resulting screen is shown on the following page.



8.4 Exporting data

There are a couple of different ways to save data to another type of file. The simplest way is to copy and paste. Once you have data in the spreadsheet grid in the lower right hand side of the screen, highlight the data that you want to save, and then click the right mouse button. That will bring up a box of three options: Copy, Select All, and Change Display Dates. Choose Copy, then move to an excel sheet or a notepad session or other program environment. Then right click on a file open in that environment, and choose paste. The data will be transferred to the excel sheet or other file, exactly as it appears on the View and Download Data screen. Note: if you start to highlight the series from the far left column of period labels, the data will be saved from the start of the database, 1980 in most cases.

Another way to save or export data is to highlight the desired series, then click on **Save** or **Save As** from the File menu. That will bring up the following dialog box:



Checking the fourth box, labelled **Save all information and data to PRN file**, and then clicking on OK will create an ascii file in column format, as shown below.

MAY11.DB	MAY11.DB	
US	GERMANY	
GDP	GDP	
V	V	
FY	FY	
198001	198001	1980
200901	200804	
200901	200804	
160804	160804	
0.00000	0.00000	1980
0.00000	0.00000	
0.00000	0.00000	
0.00000	0.00000	
1.65093	-1.34748	1981
2.93595	0.797725E-01	
4.35446	0.915644	
1.17837	0.780041	1982
-2.45690	-2.23809	
-1.16215	-1.198632	
-2.71304	-1.98216	1983
-1.39834	-1.42706	
1.48152	0.259309	
3.21620	1.03438	1984
5.65455	2.11020	
7.72092	3.65950	
8.48909	4.05547	1985
7.92212	1.20247	
6.86149	3.25096	
5.57921	2.73569	1986
4.51049	0.941049E-01	
3.62027	3.07565	
4.22596	3.03222	1987
4.17119	1.90151	
4.20521	0.986652	
3.73102	3.43840	1988
3.11389	2.12457	
2.84292	2.78509	
2.53891	1.52455	1989
3.25738	0.786447	
3.20581	1.48824	
4.48176	2.10680	
4.30636	5.07329	
4.48329	3.20655	
4.09647	3.49951	
3.65987	3.17652	
4.20230	4.10919	
3.56957	4.83028	
3.75329	2.52003	

As you can see, at the top of each column the database, country and mnemonic are provided. The V indicates that variable values, as opposed to residuals, are listed in the columns, and this is followed by the designation of the transformation, if any. The starting date for the series follows, then the date of the last historical period and the date of the last forecast imposed by the user. The number of periods of data stored comes next, along with an indication of the period of the data – 4 is for quarterly. Finally, the data is listed. Note: if differences or percentage changes are requested that require data from before the start of the database, the data will display as zero.

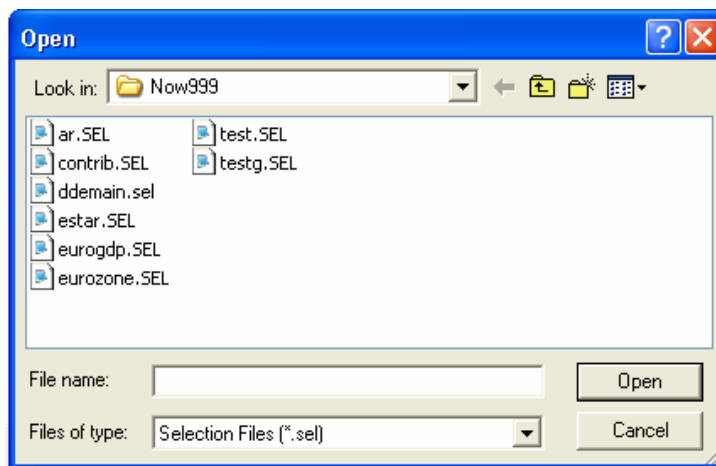
The three boxes below **Save all information and data to PRN file** allow the format of the ascii file to be altered. Check the **Excel/Comma-delimited** box if that format is preferable for later use (as opposed to the fixed field widths of the default format). A comma-delimited file will have file extension .CSV instead of .PRN. Rather than the fixed width format shown above, the ascii file created will have the individual values separated by commas. Most spreadsheet applications will read such files correctly and easily, putting one value in each cell. Spreadsheet programs can also read fixed format files, but extra steps may be required to be sure that the data are correctly assigned to individual cells.

The **Vars by Row** option will transpose the file, so that the time periods go across the page rather than down. The **Reduced Format** option creates a file that has dates as the first row or column of data and country and mnemonic names have been combined. **Access/DB format** creates a .CSV file formatted to be imported into Access. Note: these choices can all be applied in combination.

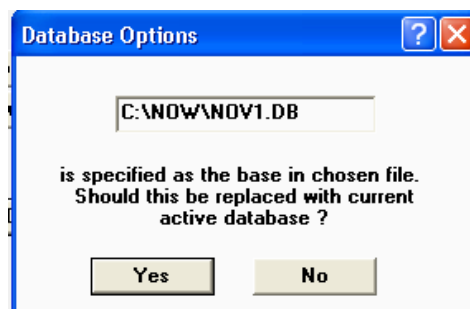
The box labelled **Save selection info to SEL file** will store the information about the variables selected – country, variable name, transformation, and the database name. Any variable calculations will also be saved. Click on the box labelled **Update corresponding PRN file automatically** if you would like to save the variables whenever you click on the **Update Datafiles** box after a model solution (see Chapter 5). The *.PRN file could then be linked to a spreadsheet that could produce customized tables whenever desired.

8.5 Retrieving information from SEL and other files

You can retrieve the information on variable selection from a PRN file or SEL file that has already been saved. To do this, choose **Open** from the **File** menu on the **Get Data** screen. A file opening box will appear, listing by default all files in the directory where the Oxford Economics software is stored with extension SEL. However, you can use the list box at the bottom to switch to PRN or CSV files. Any of these file types can be read to provide information about the variables that were selected in their creation.



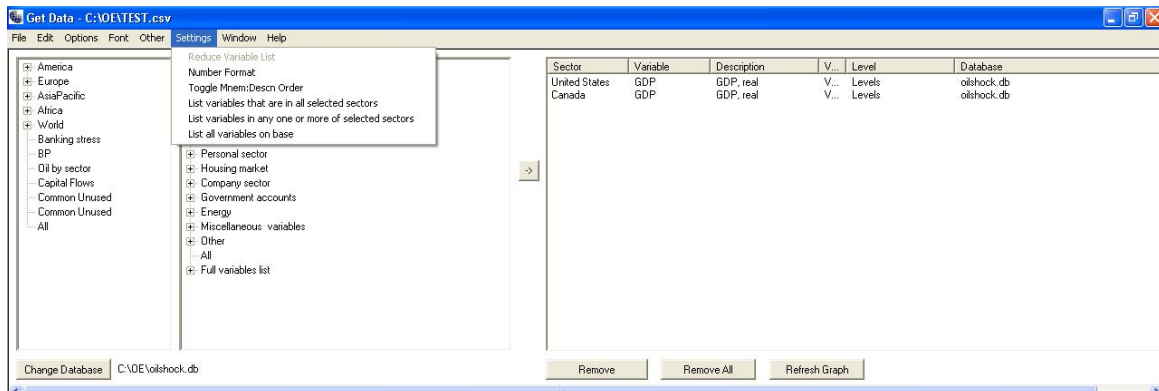
Once you have retrieved the variable list, you can edit it, adding or deleting lines. If the variables in the reopened SEL file are from more than one database, then the file will be opened exactly as it was created. However, as a special case, if all of the variables were chosen from the same database, the following dialog box will appear:



If you click on **Yes**, then the database name in the SEL file, NOV1.DB in this case, will be replaced with the name of the currently opened database. This will allow the user to update the series in a PRN or CSV file whenever desirable.

8.6 Settings

There are a number of settings that may be adjusted in View and Download Data according to the user's preferences. They are found by clicking on Settings in the grey toolbar at the top of the page.



The first option Number Format will bring up a dialog box to check whether very large and very small numbers should be expressed in scientific notation. The default sets scientific notation on.

The second option is to switch the display of the series within each sector between alphabetized by description (the default) and alphabetized by mnemonic. Once set, each of these first two option will remain in force until the user explicitly changes them, even if the software is closed down and reopened.

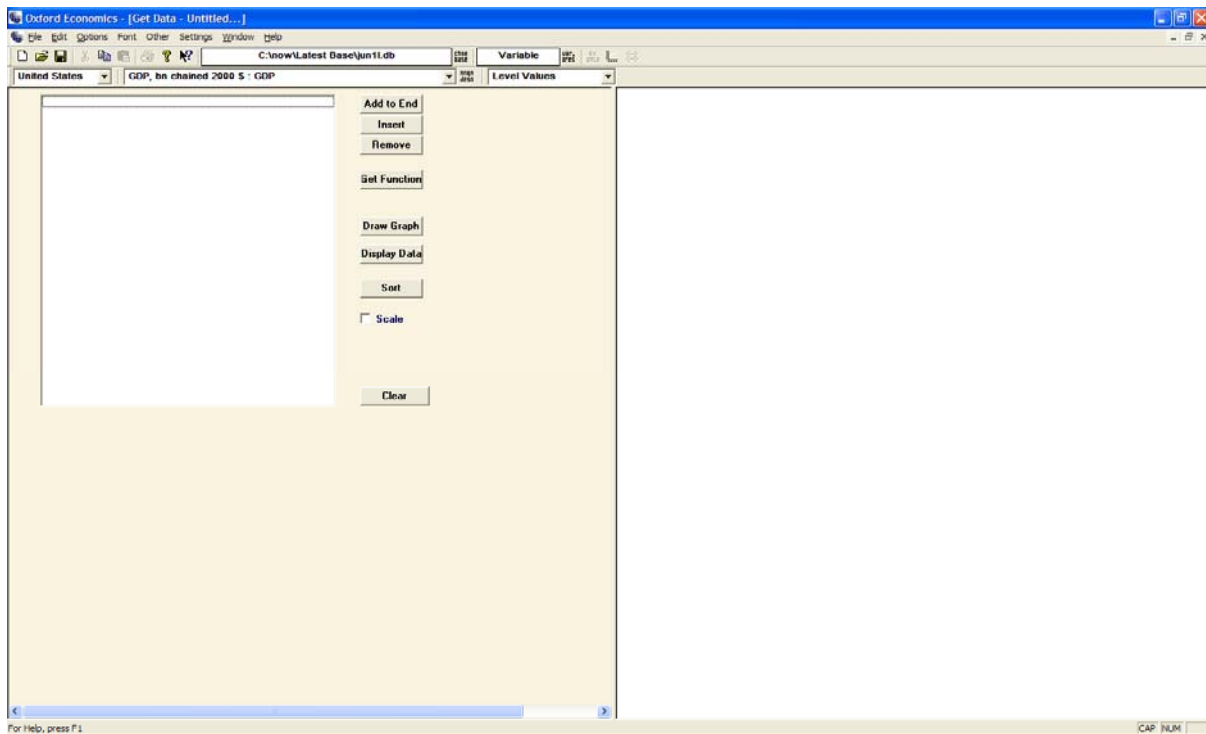
The remaining options are only set for a specific session. They are used to restrict the lists in meaningful ways. One is to list only those variables that appear in common among the countries specified and another is to list only those variables that exist in at least one of the countries specified. For example, if we select the US and Canada, and then expand the list for GDP and Domestic Demand, the list of variables includes such variables as Consumer expenditure, rural and Consumer expenditure, urban. But those concepts don't exist for either the US or Canada (they can be found in the China model). If we select either of the two restrictive settings, the Chinese variables will disappear from the list.

Finally, the setting to list all variables returns the lists to the default condition. And as mentioned, the restrictive settings will have to be reset if desired in a subsequent session. This is because there is a cost in terms of the time required to create the customized lists any time the user changes the countries selected.

9 The Alternative Data Facility

In addition to the data facility described in the previous section, we have retained an earlier version. We've done this because the data are organized in a different fashion, which may be easier for some purposes.

As in the case of the main data facility, the alternative data facility is used to gather data from databases. Selected data series can then be graphed, listed or exported to various types of files that are compatible with other software packages. The data may be in level form, or they may be transformed in one of several ways. In addition, it is possible to calculate expressions involving one or more variables from a database. To begin, click on the **Advanced Options** icon on the main menu and then click on the **Alternative Data Facility** option.



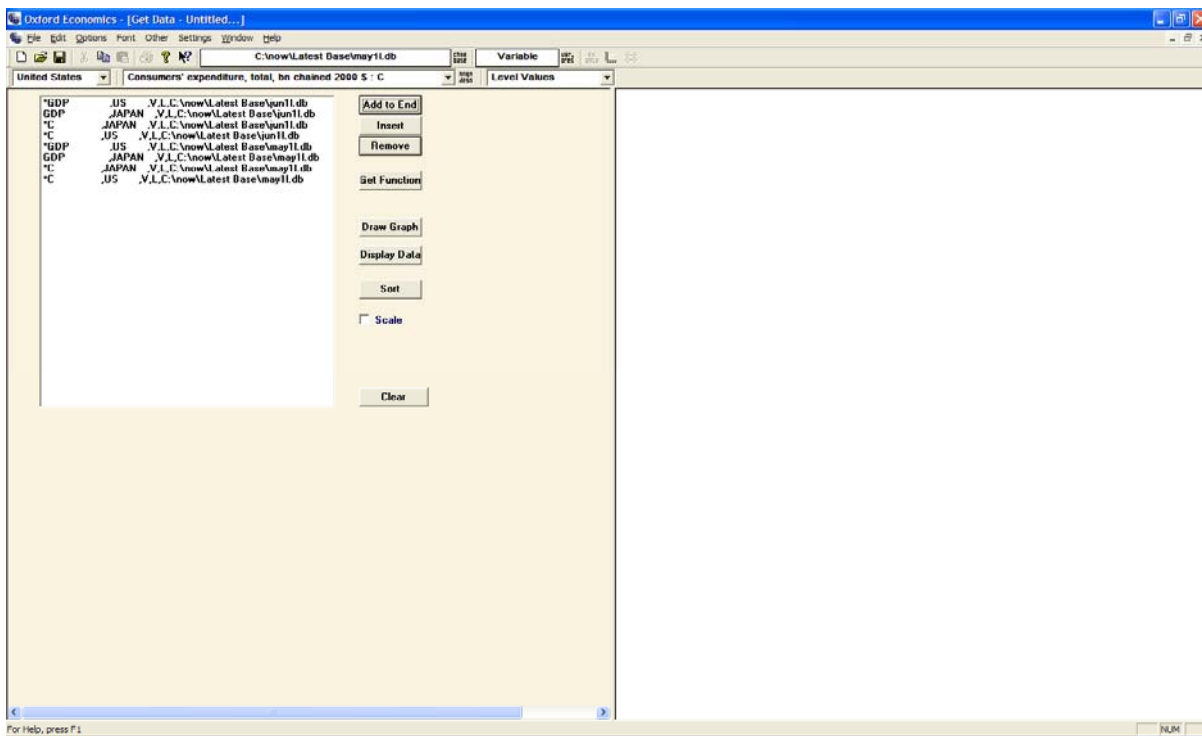
9.1 Selecting variables

The toolbar at the top of the screen contains a list box for the database name. To switch to a different database, click on the **chge base** button to the right of the list box, locate and highlight the name of the desired base on the list, and click on **OK** to make the selection. There is another list box on the toolbar that allows the user to toggle between actual values and residuals for endogenous variables. Most of the time, this will be left set to Variable.

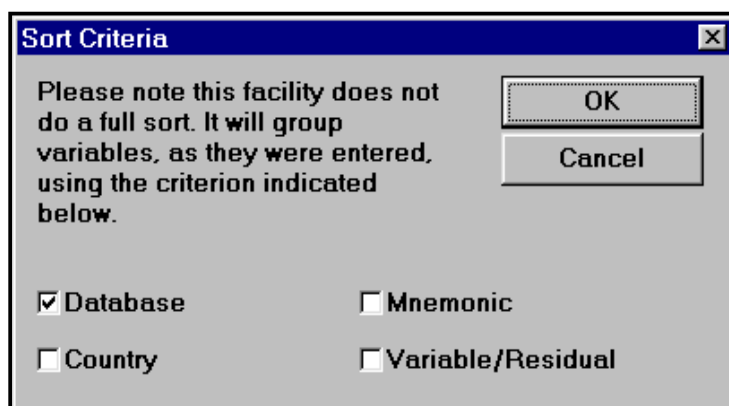
Below the toolbar are three additional list boxes, for the selection of the country, variable, and transformation. To change the selections, click on the arrow to the right of each list box, then locate and

highlight your selection. Note: the first six choices in the transformation list box provide quarterly data, in level, q-on-q % changes, compound growth rates, or differences, and annual % changes and differences calculated from the same period of the previous year. The final four options are for annual data. For annual % changes, the annual values are calculated first, then the % changes.

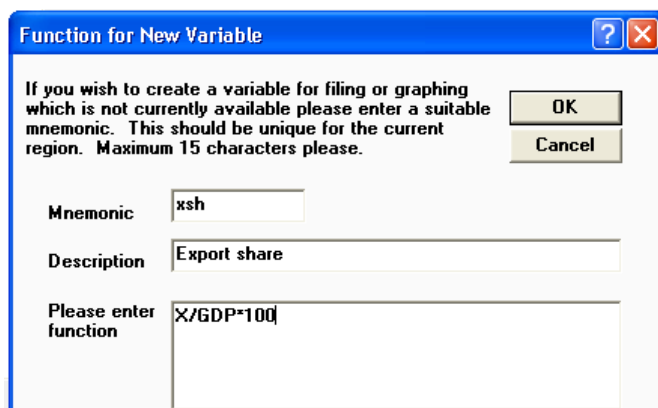
When the list boxes identify the desired variable, click on the button labeled **Add to End**. This will put a line identifying the selection into the large box to the left of the screen. Continue using the list boxes to identify other series and add those lines to the end of the list. If you want to place a series in the middle of the list rather than at the end, highlight the line you would like it to precede and click on Insert instead of Add to End. To remove a line from the list, highlight it and click on Remove. Your screen will look something like this:



If you would like to reorganize the screen so that variables are grouped more logically, click on Sort. This will bring up a box of options for sorting the series. Select one or more of the criteria offered to reorganize the list.

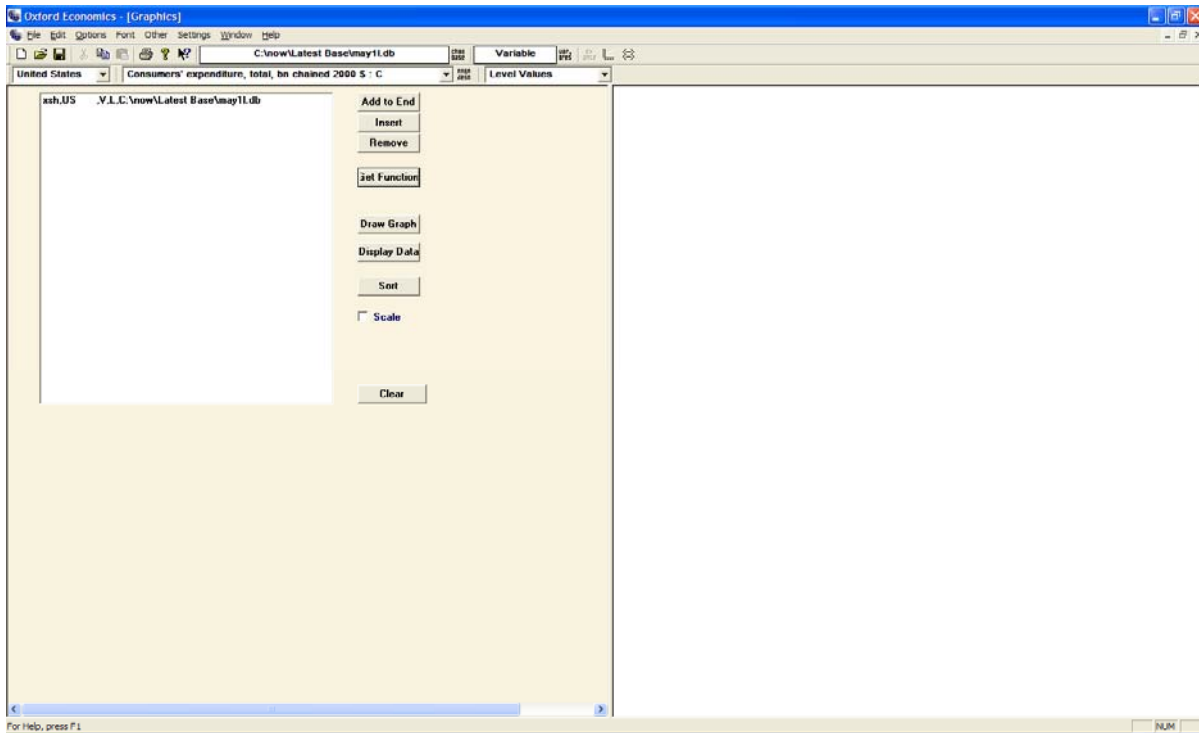


The button labelled **Get Function** allows the user to specify an expression to be used to calculate a new variable not in the database from a variable or variables that are in the database. For example, the user might wish to calculate the ratio of exports to GDP. After clicking on the **Get Function** button, this box will appear:



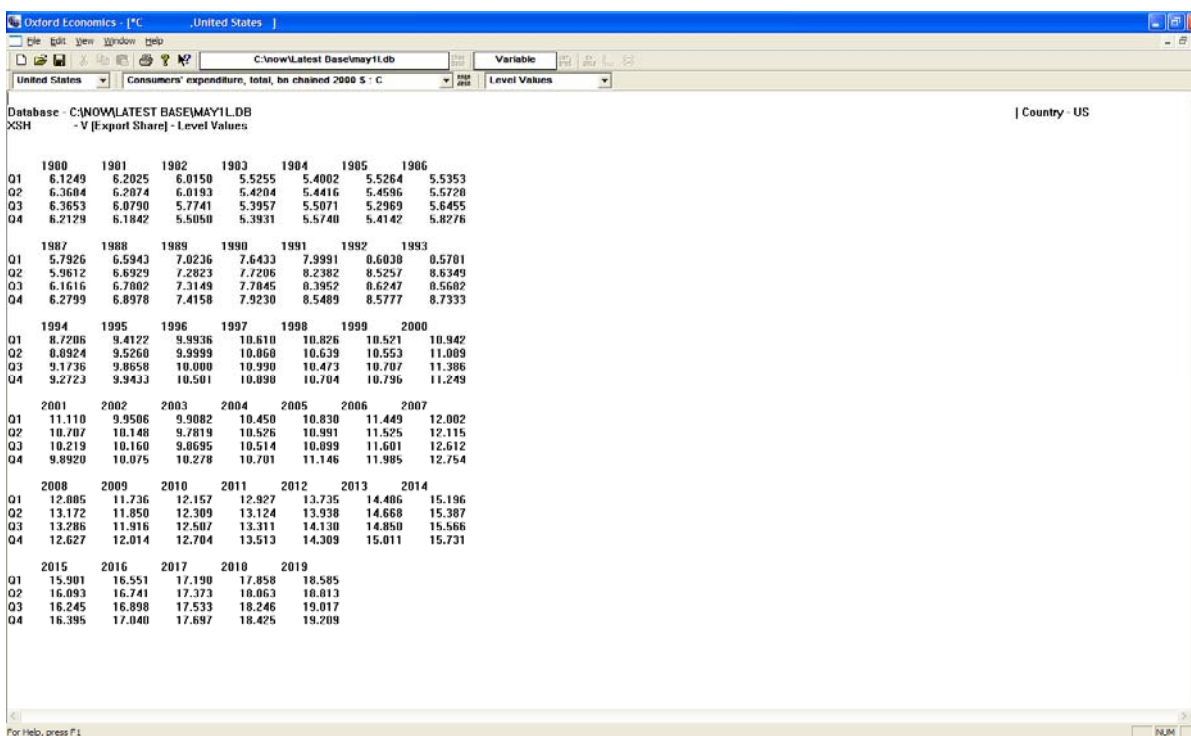
Type a mnemonic of your choosing into the first box, and if you wish, a description of the variable into the second. Type in the expression to be calculated in the third box. The example here shows the calculation for the export share of GDP. When you click on OK, the series will be calculated, using data from the country that is currently selected. A line referring to the mnemonic you have selected will be entered into the box of selected variables. The calculated data may then be displayed, graphed, or saved to an ascii file, just as any series from the database.

Note: the series calculated is a temporary variable. It is not stored on the database. To add series and equations to the database, see Chapter 11. However, the calculation will be retained during the session, so that if you want the same transformation calculated for several countries, you would create it for the first country, as described above, then switch to the second country, click on Get Function, and type in the name of the mnemonic you had chosen for the first country. When you click on the description or function area or on OK, the entries from the first country will be recalled, and entries added to the variable selection box, as shown below. Note: there is no case distinction.



9.2 Displaying data

Any series listed in the box of variables, whether in level form or transformed and whether a series from the database or one that was calculated via the **Get Function** screen, may be displayed. Highlight the selected series by clicking on it – only one series may be selected to be displayed at a time – and click on the button labelled **Display Data**. The data will be shown in the same Windows browser that is used to display tables. The data are arranged by year, as shown:



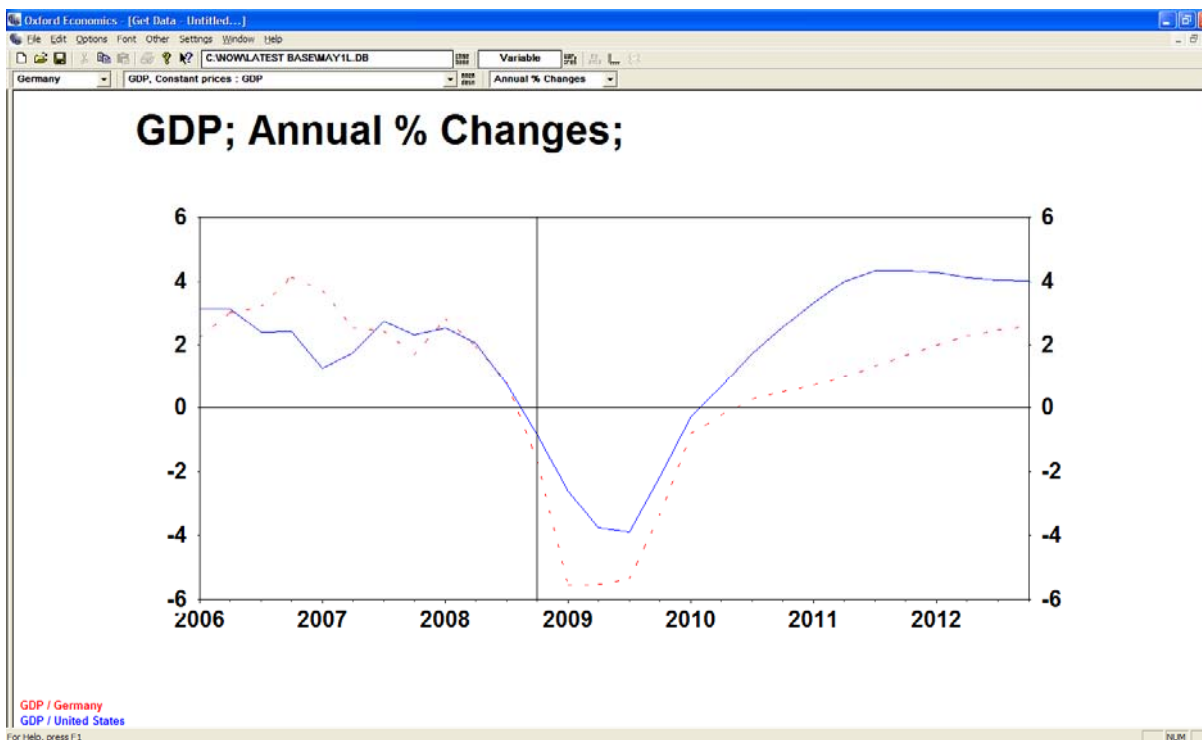
9.3 Graphing variables

To graph up to four variables, select them from the list in the variable selection box by clicking on them. If the lines are adjacent, you can drag the mouse cursor over them. If they are not adjacent, click on them in succession while holding down the control key. Then click on the button labelled **Draw Graph**. Click on OK and the graph will be drawn, as shown on the top of the following page.

The lines are identified by means of colour, and a vertical line separates historical data from forecast. By default, a horizontal line at the value of zero is drawn. If multiple series are graphed, the vertical line is on the earliest historical endpoint.

Once you click on the graph, to make it active, some basic keys can be used to alter it. The **Insert** key will add years to the graph, extending it into the future, as far as there are data available in the database. Similarly, the **Delete** key will remove years of data from the graph. The **←** and **→** will scroll the graph to the left or the right. If you have multiple lines plotted, the **F2** key will replace them with the difference between the first and subsequent curves, while **F3** replaces them with similar percentage differences. These can be useful in examining the effect of a change in scenario on particular variables. **F4** will return the graph to normal after invoking differences or percentage differences.

If two lines are plotted, **F5** will cause two axes to be used. Since two zero lines would be confusing, the zero line is omitted from dual-axis graphs. **F4** will again return the graph to normal – i.e. a single axis.



The **TITLE** can be replaced by clicking on it and editing it as desired, and it can be centered between the axes by clicking on the far right icon in the toolbar at the top of the screen. The colour-coded labels at the bottom of the page may also be edited, and they can be repositioned on the graph by clicking on them with the right mouse button and dragging them to the desired location. When the right mouse button is released, the label will be dropped into place. Double-clicking with the left mouse button will cause the word Text to appear at the cursor position. This text can be edited and repositioned to enhance the graph.

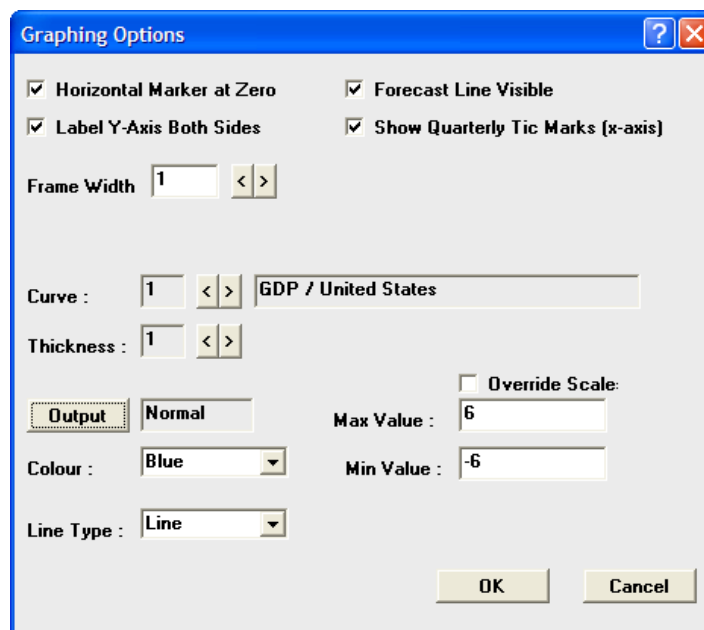
By default, the variables are displayed as lines, on the same scale, which is shown on both sides of the graph. To adjust these and other parameters, click on **Options** in the toolbar at the top of the screen, which will bring up the screen shown at the top of the next page.

The first four check boxes control whether the horizontal zero marker and the vertical forecast line are present, whether the Y-axis is labeled on both sides of the graph (for single axis graphs only) and whether the quarterly tick marks are shown on the X-axis. The frame width refers to the thickness of the lines used in the graph box, the zero marker and the forecast line. The < and > buttons can be used to alter this thickness.

The rest of the options pertain to the lines of the graph. Set the options for each line in turn. Line 1 comes up by default, and you can see its label in the box to the right. Just below you will see the thickness of the curve, which can be adjusted as described above for the frame width. All of the option

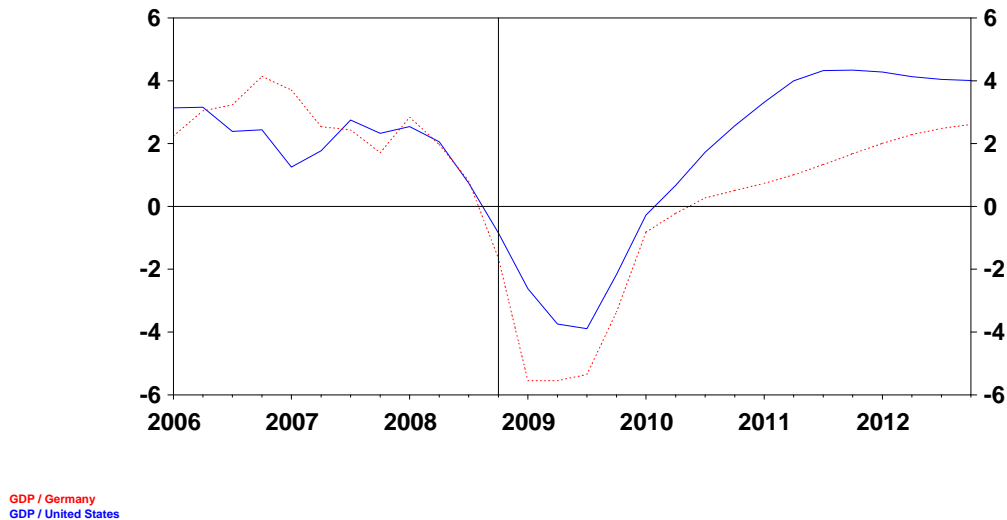
choices will be retained by the software to be used for subsequent graphs. At the bottom of the screen are list boxes to change the colour of the line and the line style (solid, dash or dotted). To the right, the minimum and maximum scale values are displayed. If you wish, you can alter the scale by clicking on the values and overtyping, but you must also click on the override checkbox above for the new scale to be implemented. Finally, there is an option to switch the variable from a line to a bar plot.

We have found it useful to keep two sets of options, depending on whether the graph is to be printed on paper or made into an overhead transparency. The button labelled **Output** will switch between the two sets of parameters.



To use the final graph in another application, such as a word processor, click on Edit, Copy from the toolbar, or the copy icon. You will be asked to select the type of output to be created – that is, which set of option parameters to use, for solid (Normal) or transparency. For a word processor, select solid. Switch to your word processor application. The remainder of this instruction is for Word – details may differ for other word processors. Click on Edit and Paste Special and Picture. The graph will be placed in your document, but it will be tiny. Click on it, and you will see the resizing points appear. Click on the lower right hand corner and drag, and the graph will be expanded. That is how the graph just below was pulled into this document. (Other graphs shown in this document were imported as screen captures.)

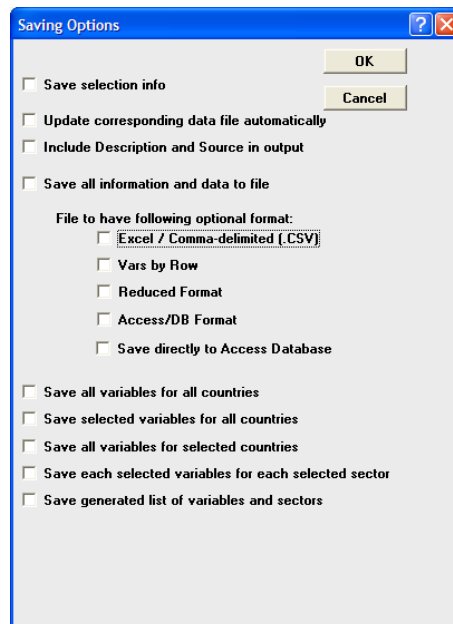
GDP; Annual % Changes;



It is also possible to print the graph from within the Oxford Economics software. To send the graph to the printer, click anywhere on the graph to make it the focus. Then either click on the printer icon in the toolbar or select Print from the File menu. You may first want to select Print Setup from the File menu to set such options as the paper size and orientation. If the printer is a colour printer, the graph will be displayed as shown on the monitor. With a black and white printer, the graph will identify lines by line style – solid, dotted and so on. There will be no distinction between historical and forecast data.

9.4 Saving data

To save the data for the variables you have selected, click on **Save** or **Save As** from the File menu.



Checking the fourth box, labelled **Save all information and data to PRN file**, and then clicking on OK will create an ascii file in column format, as shown below.

MAY11.DB	MAY11.DB
US	GERMANY
GDP	GDP
V	V
FY	FY
198001	198001
200901	200804
200901	200804
160804	160804
0.00000	0.00000
0.00000	0.00000
0.00000	0.00000
0.00000	0.00000
1.65093	-1.34740
2.93595	0.797725E-01
4.35446	0.915644
1.17837	0.780041
-2.45690	-0.238009
-1.16215	-0.138632
-2.71304	-1.95216
-1.39834	-1.42706
1.48152	0.259309
3.21620	1.03438
5.65455	2.11020
7.72092	3.45950
8.48909	4.05547
7.92212	1.20247
6.84149	3.25096
5.57911	2.73569
4.51069	0.961069E-01
3.62027	3.07565
4.22596	3.03222
4.17119	1.90151
4.20521	0.986652
3.73102	3.43840
3.11389	2.12687
2.84292	2.79809
2.83891	1.82455
3.25738	0.786447
3.20581	1.48824
4.48176	2.10480
4.30606	5.07529
4.48329	3.20655
4.09647	3.49951
3.65987	3.17652
4.20230	4.10919
3.56987	4.83028
3.75329	2.52003

As you can see, at the top of each column the database, country and mnemonic are provided. The V indicates that variable values, as opposed to residuals, are listed in the columns, and this is followed by the designation of the transformation, if any. The starting date for the series follows, then the date of the last historical period and the date of the last forecast imposed by the user. The number of periods of data stored comes next, along with an indication of the period of the data – 4 is for quarterly. Finally, the data is listed. Note: if differences or percentage changes are requested that require data from before the start of the database, the data will display as zero.

The three boxes below **Save all information and data to PRN file** allow the format of the ascii file to be altered. Check the **Excel/Comma-delimited** box if that format is preferable for later use (as opposed to the fixed field widths of the default format). A comma-delimited file will have file extension .CSV instead of .PRN. Rather than the fixed width format shown above, the ascii file created will have the individual values separated by commas. Most spreadsheet applications will read such files correctly and easily, putting one value in each cell. Spreadsheet programs can also read fixed format files, but extra steps may be required to be sure that the data are correctly assigned to individual cells.

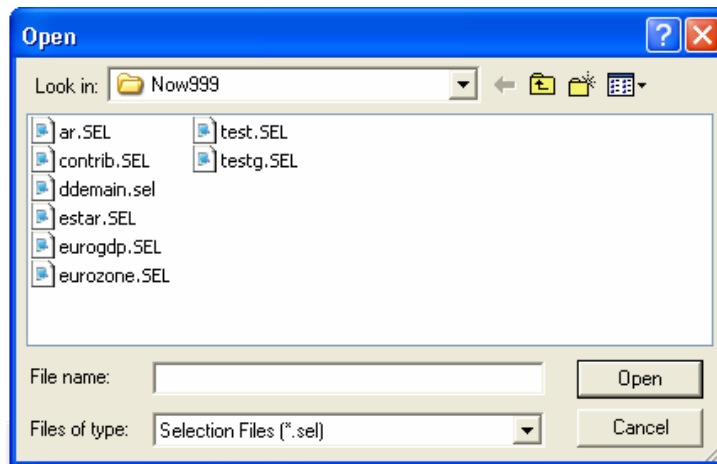
The **Vars by Row** option will transpose the file, so that the time periods go across the page rather than down. The **Reduced Format** option creates a file that has dates as the first row or column of data and country and mnemonic names have been combined. **Access/DB format** creates a .CSV file formatted to

be imported into Access. Note: these choices can all be applied in combination.

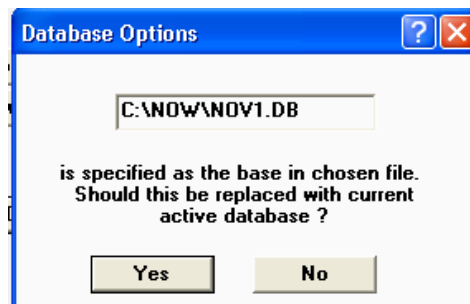
The box labelled **Save selection info to SEL file** will store the information about the variables selected – country, variable name, transformation, and the database name. Any variable calculations will also be saved. Click on the box labelled **Update corresponding PRN file automatically** if you would like to save the variables whenever you click on the **Update Datafiles** box after a model solution (see Chapter 5). The *.PRN file could then be linked to a spreadsheet that could produce customized tables whenever desired.

9.5 Retrieving a .PRN, .CSV or .SEL file

You can retrieve the information on variable selection from a PRN file or SEL file that has already been saved. To do this, choose **Open** from the **File** menu on the **Get Data** screen. A file opening box will appear, listing by default all files in the directory where the Oxford Economics software is stored with extension SEL. However, you can use the list box in the lower left corner to switch to PRN or CSV files. Any of these file types can be read to provide information about the variables that were selected in their creation.



Once you have retrieved the variable list, you can edit it, adding or deleting lines. If the variables in the reopened SEL file are from more than one database, then the file will be opened exactly as it was created. However, as a special case, if all of the variables were chosen from the same database, the following dialog box will appear:



If you click on **Yes**, then the database name in the SEL file, NOV1.DB in this case, will be replaced with the name of the currently opened database. This will allow the user to update the series in a PRN file whenever desirable.



10 List information from Database

There are several ways of listing information from a database in quantity that may be useful to the forecaster. To begin, click on **Advanced Options** on the main menu. Then select **List Information from Database**. The following screen will appear:

At the top of the screen is the default database. If you wish to create listings from a base other than the one listed as the main base, click on the **Change** button to the left. A standard Windows file opening box will appear. Select the base you prefer, and click on **OK**.

Enter a title if you wish. This title will appear at the top of the listing created. Set the date range by clicking on the appropriate boxes and resetting the values. The date range is applicable to the Variables and Residuals, Differences, and Percentage Differences listings.

If you check the box beside **Variables** and **Residuals**, you will create an ascii file that contains for each variable in each country selected, and for each time period in the date range, the equation calculation, the residual, and the variable value. A portion of such a file is shown below. For the periods over which the variable is fixed, the third column, labelled Act/Fcst, contains the actual historical data, and the value in the Residual column is calculated as the actual less or divided by the computed value (depending on whether the residual is additive or multiplicative). Over the forecast period, the Act/Fcst column contains the forecast values, and has been calculated as the computed value plus or times the residual, which has been set by the forecaster. Note: if the box marked **All Countries** is checked, the listing generated will be very large.

14001 GDP				14002 *IP				14003 *C			
ITALY				ITALY				ITALY			
		Computed....	Residual....			Computed....	Residual....			Computed....	Residual....
			Act/Fcst				Act/Fcst				Act/Fcst
2008	1	323.6120	0.0000	323.6120	109.3114	0.9837	107.5333	183.4630	1.0264	188.3100	
	2	321.6154	0.0046	321.6200	109.0629	0.9756	106.4000	182.0642	1.0219	186.0700	
	3	319.0310	0.0000	319.0310	107.7572	0.9531	102.7000	181.0607	1.0339	187.2080	
	4	312.1750	0.0000	312.1750	101.6006	0.9254	94.0333	181.7574	1.0215	185.6600	
2009	1	301.7282	2.8298	304.5580	94.2065	0.8998	84.7667	184.9657	0.9778	180.8669	
	2	302.3219	0.0000	302.3219	90.5034	0.9103	91.3449	173.4461	1.0420	180.0669	
	3	301.7173	0.0000	301.7173	86.4070	0.9403	81.2491	174.7873	1.0399	181.7573	
	4	301.7172	0.0000	301.7172	87.0213	0.9350	81.3648	176.3399	1.0361	182.6974	
2010	1	301.7178	0.0000	301.7178	84.7490	0.9370	81.2836	177.5656	1.0339	183.5814	
	2	301.7250	0.0000	301.7250	86.0464	0.9365	81.3336	179.2400	1.0319	183.9307	
	3	301.8781	0.0000	301.8781	87.0209	0.9370	81.5375	178.6089	1.0324	184.3933	
	4	303.0877	0.0000	303.0877	87.6883	0.9345	81.9451	179.5381	1.0316	185.2200	
2011	1	304.2974	0.0000	304.2974	88.1156	0.9356	82.4367	179.7758	1.0349	186.0466	
	2	305.5063	0.0000	305.5063	88.9497	0.9390	83.5246	180.4055	1.0390	187.4416	
	3	306.7156	0.0000	306.7156	89.9310	0.9423	84.7430	181.6193	1.0390	188.0475	
	4	309.0008	0.0000	309.0008	91.4088	0.9387	85.8031	182.6335	1.0411	190.1395	
2012	1	311.8006	0.0000	311.8006	92.6755	0.9314	86.3173	183.4229	1.0428	191.2649	
	2	314.4995	0.0000	314.4995	93.7019	0.9267	86.8314	184.5961	1.0415	192.2592	
	3	315.9360	0.0000	315.9360	94.0259	0.9290	87.3457	185.6034	1.0407	193.2396	
	4	318.0058	0.0000	318.0058	94.8263	0.9265	87.8594	187.1570	1.0366	194.0125	
2013	1	319.9557	0.0000	319.9557	94.0262	0.9320	88.7377	187.5266	1.0386	194.7594	
	2	321.4113	0.0000	321.4113	95.3763	0.9320	88.8876	188.0879	1.0394	195.5033	
	3	321.6072	0.0000	321.6072	95.2155	0.9309	89.4020	189.1022	1.0370	196.2492	
	4	323.6008	0.0000	323.6008	96.3846	0.9329	89.9159	190.3323	1.0350	196.9951	
2014	1	325.3807	0.0000	325.3807	96.3378	0.9307	90.4305	190.5311	1.0370	197.7407	
	2	326.7023	0.0000	326.7023	97.3556	0.9341	90.9444	191.0509	1.0389	198.4853	
	3	326.8790	0.0000	326.8790	97.2050	0.9409	91.4579	192.0368	1.0375	199.2303	
	4	328.0837	0.0000	328.0837	98.4061	0.9346	91.9724	193.2634	1.0347	199.9762	

The box labelled **Fixes and Equations** provides two types of information in one ascii file. First, the equations for all of the endogenous and identity variables in the countries selected are listed. However, the equations are written using variable locations, with series mnemonics listed below. The same information is provided in a far more readable form in the equation help files, and if you would like a complete listing of any countries' equations, we recommend browsing or printing these files.

The second type of information is a summary of the fixes that apply on all of the data for the selected countries. The last historical data period can be identified by the type 1 or (rarely) a type 2 fix on the data point. If the database is one that you have created by altering assumptions and solving the model, there will be type 3 and type 4 fixes as well indicating variable values have been imposed for the future. Note: if the box marked **All Countries** is checked, the listing created will, again, be very long.

The boxes labelled **Differences** and **Percentage Differences** provide a means of comparing every variable in a database with its counterpart in another database. If you have made a model solution, the starting base will be the default for the comparison database. Otherwise, the **Base for Diff**s will be empty and you will be prompted for the name of the base to compare against. To the right are threshold values, below which differences or percentage changes are considered to be insignificant. The actual or percentage differences are calculated over the range specified, and then listed in a fairly concise columnar form, as shown below. Periods for which no variables show changes above the threshold are not shown, as are any variables that have no change above the threshold over their entire range.

JUN11.OUT - WordPad

File Edit View Insert Format Help

Base file 11 used for differences C:\WORLD\PUBLIC GLOBAL\JUN11.DB
12/05/2009 21.24.48 Data on file 1980 1 to 2019 4 for 13223 variables

Variable % differences greater than 0.00 from Base file 11 2008 1 to 2012 4

% difference from file 11	1001	1002	1003	1004	1005	1006
	*GDP	*IP	*C	*IF	*IPGR	*IPRD
	US	US	US	US	US	US
2008 1	0.000	0.000	0.000	0.000	0.000	0.000
2	0.000	0.000	0.000	0.000	0.000	0.000
3	0.000	0.000	0.000	0.000	0.000	0.000
4	0.000	-0.032	0.000	0.000	0.000	0.000
2009 1	0.113	0.236	-0.149	0.385	0.378	-0.272
2	0.176	0.321	-0.180	0.503	0.870	-0.158
3	0.206	0.721	-0.130	0.797	1.249	0.276
4	0.129	0.536	-0.016	1.459	2.153	1.166
2010 1	0.151	0.505	0.001	1.976	2.802	1.964
2	0.230	0.512	0.022	2.088	2.964	2.059
3	0.271	0.529	0.036	1.839	2.470	2.208
4	0.252	0.555	0.025	1.749	2.455	2.355
2011 1	0.304	0.593	-0.020	1.776	2.344	2.442
2	0.293	0.648	-0.053	1.782	2.205	2.530
3	0.261	0.598	-0.069	1.777	2.133	2.602
4	0.243	0.511	-0.077	1.773	2.103	2.657
2012 1	0.233	0.434	-0.097	1.765	2.069	2.673
2	0.235	0.425	-0.098	1.765	2.041	2.713
3	0.241	0.405	-0.055	1.777	2.036	2.753
4	0.251	0.407	-0.076	1.802	2.055	2.755

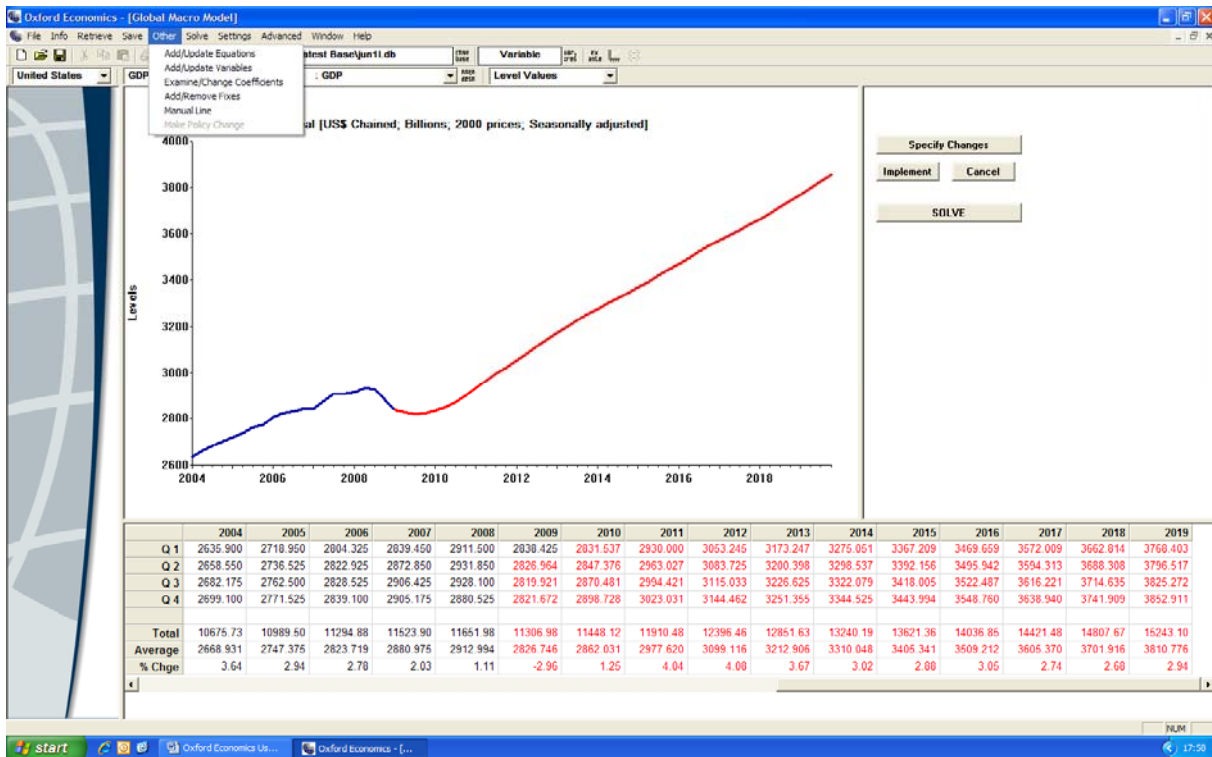
% difference from file 11	1007	1008	1009	1010	1011	1012
	*GI	*GC	*ST	IS	*X	*XS
	US	US	US	US	US	US
2008 1	0.000	0.000	0.000	0.000	0.000	0.000
2	0.000	0.000	0.000	0.000	0.000	0.000
3	0.000	0.000	0.000	0.000	0.000	0.000
4	0.000	0.000	0.000	0.000	0.000	0.000
2009 1	0.855	-0.041	0.198	-11.861	0.436	0.862
2	-0.002	-0.002	0.800	-34.916	-1.037	0.429
3	-0.003	0.003	1.225	-31.135	-0.972	0.820
4	-0.004	0.018	1.044	24.097	-0.867	1.380
2010 1	-0.004	0.033	0.733	26.507	-0.946	1.291
2	-0.004	0.024	0.478	625.416	-0.980	1.224

For Help, press F1

Finally, if the box labelled **Coefficients** is checked, a listing of coefficients will be generated. Country selection has no impact on this listing. The coefficients listed are not the coefficients of the model equations. Rather they are values that control the simulation – determining the number of iterations allowed per period, setting convergence criteria, determining which of the country models will be solved, etc. The listing provides no information as to the role of each coefficient, so we recommend viewing, and changing these coefficients if you wish, through the Other option, which is described in Chapter 11.

11 Advanced Facilities

There are several additional capabilities that are available. These functions are accessed from the Variable Data screen, which appears when the Run Model button is selected from the main menu. In the toolbar at the top of the screen, the third option is **Other**. Click on this option, which will produce a pull-down menu.



11.1 Add/Update Equations

The first option is to supply new equations to the model. These may be replacements for existing equations or equations for variables that are new to the model. Click on **Add/Update Equations**:

Adding / Updating Equations

Eqns from EQN File Eqns from PCGive File Eqns from TSP File

Equation Active: 1980 1 to 2019 4

☒ Behavioural Equation ☐ Identity ☐ Transformation

For annual variable on non-annual base, give end: 0

Please type in your equation:

Options OK Cancel

The three buttons for the top are to be used if there are equations stored in a file. If the equations were estimated in TSP or PCGive, click on the appropriate button and, when the file opening box appears, select the file of equations to be opened. The equations will be read and, assuming no errors are found, a message will appear to indicate that the equations have been processed.

If the equations were estimated in some other statistical package or are from some other source, then it is still possible to read them into the model by clicking on the first button, labelled Eqns from EQN file and then selecting the file. It is important that the file of equations follows some conventions:

The equations are to consist of algebraic combinations using standard operators and the variable mnemonics. (Four digit variable identifiers are also permissible, but mnemonics are more convenient.) The equations must be in simple form. That is, the left hand side of each equation must consist of one variable, which may be transformed into log form or change form. It cannot be, say, the ratio of two variables.

Operators are:

+ - * / ()

** Exponentiation

Reserved words (do not use as mnemonics)

Tyyp Time trend set to 1 in year yy period p and incremented by 1 each period

If yyp is omitted, it is assumed to be 701.

Qn Period switch, set to 1 if current period is n, else 0.

Functions (do not use as mnemonics) Note: all arguments are to be in parentheses.

exp Exponential

ln Natural logarithm

log Natural logarithm

abs Absolute value

dn Difference between current period and n periods back. If n is omitted, it is assumed to be 1

sn Sum between current period and n periods back. If n is omitted, it is assumed to be 1

R Residual

Blank lines in the equation file will be ignored. A % in the first column of a line indicates that the line is a comment, which can be very useful for documenting the equations. The % is also used as a continuation character – if the equation will take more than one line (80 characters per line), the first line(s) should end with the %. The maximum number of characters in an equation is 1000.

The equations will be checked for syntax and variables. A message will be displayed when any syntax problem is encountered, but processing will be allowed to continue so that any other errors can be spotted. If an equation defines a variable for which data have not been provided, the variable will be added to the model with zero values. Any right hand side variable that is not already in the database or defined by one of the equations in the EQN file will be flagged. It can be added to the model as an exogenous variable and data can be added before the model is run.

Note: the equation help files provided for each country in the model are valid EQN files.

The **equation active** dates and the **equation type** options do not apply to equations entered from a file. By default, equations entered are assumed to be behavioral, that is they are endogenous with residual terms. The residuals will be additive in the equation is stated in level terms, but multiplicative if the equation is stated in log form (this may be overridden by explicitly including a residual term in the equation). Also by default, the equations entered will be active over the entire range of the database. They are made active over the historical part of the database so that historical residuals can be calculated. These are useful both in checking the accuracy of the equation and as a guide to setting residuals in the forecast period.

However, if you wish to restrict the range of your equations, you may do so by preceding them in the in the EQN file with a line containing the letter Q and the date range in the following format:

Q YYYY P YYYY P

The range will apply to all subsequent equations until a new range is encountered.

Similarly if you wish to force an equation to be an identity, it should be preceded by a line that starts with an I. The I may be followed by a date range as above if desired. Only the equation directly following the I line will be affected.

It is also possible to force a variable to be a transformation, which means that instead of being solved during each iteration, it is calculated only once for each time period before the iterations begin. This type of equation is used by OXFORD ECONOMICS forecasters in some cases to calculate historical values that are determined by other variables in the database or to manage the forecast of residuals or exogenous variables. This is done by replacing the Q or I with a T in the line before the equation. However, it is not recommended in general for client use.

Note: The equations in the file will be added to the model for whatever country is active on the Variable Data screen. If you want to apply the same set of equations to more than one country, you will add them to the first country, then return to the variable data screen to reset the active country, then go back to Add/Update equations, and so on.

If you are adding just one or two simple equations and do not wish to keep them in a file, then you may enter them directly. For example, if you wanted the exports share of GDP to be a model identity, you would enter the calculation in the box, as shown below:

Adding / Updating Equations

Eqns from EQN File Eqns from PCGive File Eqns from TSP File

Equation Active 1980 1 to: 2014 4

☐ Behavioural Equation ☒ Identity ☐ Transformation

Please type in your equation:

XSHARE=X/GDP*100

Options OK Cancel

Identifying the variable as an identity will prevent a residual term from being added. Checking on the Transformation box will cause the equation to be calculated just once per time period, as described.

However the equations are entered, they are converted to lines in a run file. The variable mnemonics are replaced with six-digit variable identifiers, and if the equation is in log form, it is translated to level form. The equations will not actually be added to the database until the model has been solved with that run file. It is a good idea when solving the model to add equations to solve it over at least some portion of history so that the historical residuals will be calculated. Note: do not solve the model from the beginning of the database – without necessary lags it will fail. Allow at least 2 years from the beginning of the database before you solution period.

Note: Equations added to the model are permanent in the sense that they will be included in any databases created from the database to which the equations were added. Thus, you can add or change equations and then run model shocks to check on the equations' properties without adding the equations for each run. However, the new equations will of course not be in the next release you receive from Oxford Economics, so if you wish to keep them, they will have to be added again. Thus, it will be very important to keep the file of equations, or if you entered the equations directly, the run file.

11.2 Add/Update Variables

When updating values for a large number of series, for example, when new national accounts data are released, it is possible but cumbersome to use the variable change screen for each in turn. However, there are several formats that can be used to update quantities of data quickly. It takes a bit of time to set up initially, but worth the effort if the data set will be updated frequently.

After clicking on **Add/Update Variables**, a Windows file opening screen will appear. In the lower left corner, a pulldown menu lists possible file types. The most common type of file to use, and the one used for most of our own updating, is a spreadsheet file. Click on Spreadsheet (*.WK3) or on Spreadsheet (*.XLS) and then on the file holding updates, and the following screen will appear:

The options allow for complete or partial updates from the spreadsheet. Select an option, click on OK, and the data will be processed into a run file. For the data to be incorporated into a database, the model must then be solved, starting in the earliest period for which data is provided.

Getting the data into a valid WK3 or XLS file is up to the user. Here is a portion of a valid WK3 file. The structure of the file must follow the example exactly, but in general, there is no distinction between upper and lower case, and column widths and fonts may be set as desired.

OEF mnemonic	IS	pc	QMF	PC	QMF
OEF country	GERMANY	GERMANY	GERMANY	GERMANY	germany
Variable/Residual	VAR	VAR	RES	RES	VAR
Dataset source	OEF	OEF	OEF	OEF	OEF
Date of data (YYMMDD)	930803	930727	930803	930727	930803
Source mnemonic/Transformatic	PLKMQ	PAARQ	PLJBQA	Pc/100	PLJBQ
Periodicity	4	4	4	4	4
No. of observations	32	38	35	38	36
First period given(YYYYPP)	197301	197301	197304	197301	197303
Time series from	197301	95.4	91	#N/A	0.91
		95.4	91	#N/A	0.91
		95.4	91	#N/A	0.91
		97.3	91	93.8	0.91
	197401	99.2	93	96.5	0.93
		99.3	102.3	100.5	1.023
		99.5	102.3	101.2	1.023
		102.2	102.3	101.9	1.023
	197501	103.4	102.3	104	1.023
		101.8	109.5	105.4	1.095

The label 'OEF mnemonic' must be found in a cell in the spreadsheet. All of the rest of the information is found relative to this base cell. The time series are defined in columns to the right of the base cell. There may be blank columns, but all data in the sheet must conform to the required format. NA values are acceptable. The series mnemonics are defined on the same row as the base cell; they are labels of a maximum length of fifteen characters and may be justified as the user desires for ease of reading.

The country definition (maximum eight characters) is on the next row. Any one spreadsheet can hold data for one or more countries or regions. It is formatted as a label. If you are updating an OXFORD ECONOMICS World Macro database rather than a database of a model you have built yourself (which would have country/region names as you defined them), the country/regions must come from the following (current) list (note, long country names must be clipped exactly as shown here):

US	CZECH	ROMANIA
JAPAN	DENMARK	RUSSIA
EURO_11	FINLAND	SINGAPORE
GERMANY	GREECE	SLOVAKIA
FRANCE	HK	SAFRICA
ITALY	HUNGARY	SPAIN
UK	INDIA	SWEDEN
ARGENTIN	INDONESI	SWITZ
AUSTRALI	IRELAND	TAIWAN
AUSTRIA	KOREA	THAILAND
BELGIUM	MALAYSIA	TURKEY
BRAZIL	MEXICO	RESTOECD
BULGARIA	NETH	OPEC
CANADA	NORWAY	EASTEUR
CHILE	PHILIPPI	AFRICA
CHINA	POLAND	LATAMER
CROATIA	PORTUGAL	RESTWORL WORLD

The Variable/Residual row must contain either the label 'VAR' or 'RES' for each data column. Normally only variables would be present, but the ability to read in residuals is also provided.

The rows labeled 'Dataset source', 'Data of data (YYMMDD)', and 'Source Mnemonic/Transformation' are optional, and may be filled in if the user wishes to document the spreadsheet.

'Periodicity' must be present, and set to 4 for a quarterly database, 12 for a monthly database, or 1 for an annual database. No of observations is optional.

'First period given (YYYYPP)' is required and defines for each series the period at which the actual data start. The row, other than the label, is formatted as a number.

The 'Time series from' row defines the period from which values may be given in the spreadsheet, not necessarily the start of actual data for any series. It is a number, not a label or a formula. Other period definitions in the same column are present only for clarity. This row also starts the definition of the series data, one period value per row and one series per column. Unavailable data at the start of the series must be defined by the Lotus 1-2-3 NA function/value. Unavailable data at the end of a series can be denoted by the NA function/value or left blank. Blank or NA data in the middle of a series will cause the series to stop being read and should not occur. Data can be numbers or formulas that produce number values.

Non-data worksheets in the WK3 file may contain anything, as long as they do not contain the label 'OEF mnemonic' else they will be taken as data sheets.

Here is a portion of a valid XLS data file:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	US Final Data																		
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9	OEF Mnemonic	GDP	IP	C	IF	IPNR	IPRD	GI	GC	ST	IS	X	XS	XGNF	XFU	M	MS	MGNF	MF
10	OEF Country	US	US	US	US	US	US	US	US	US	US	US	US	US	US	US	US	US	US
11	Variable/Residual	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR
12	Source mnemonic/Transformation																		
13	Periodicity	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
14	First Period Given	197301	197301	197301	197301	197301	197301	197301	197301	197301	197301	197301	197301	197301	197301	197301	197301	197301	197301
15	Time series	197301	1076.325	49.66667	708	157.0274	78.075	77.025	30.10809	215.4929	712.5	5.225	49.9	15.45	34.31881	1.5	67.65	15.85	37.09577
16			1088.775	50.06667	707.625	158.0173	81.25	73.125	29.02006	215.5937	724.3	11.8	52.3	16.15	35.30256	2.49	65.7	15.2	35.47906
17			1082.975	50.5	710.15	157.4094	82.6	70.075	27.86581	214.1301	729.6	5.35	52.475	16.425	35.13893	2.84	63.9	14.125	34.78267
18			1093.325	51.26667	708.05	156.5171	83.275	66.725	26.49995	215.0463	742.2	12.625	55.05	16.75	37.15965	3	64.375	14.225	34.73848
19			1093.85	50.76667	701.95	154.2191	83.225	61.875	29.80088	218.5965	748.2	6	55.75	16.625	37.84217	3.05	62.175	14.525	34.76399
20			1086.975	50.83333	704.75	153.1789	83.075	59.175	31.22957	218.2241	756.5	8.275	58.475	17.95	39.43886	3.08	65.475	14.95	35.06625
21			1076.45	50.6	707.9	150.5549	82.125	57.2	30.42273	220.0153	759.4	2.925	55.325	17.05	37.25994	2.97	64.35	14.65	34.43009
22			1072.225	48.63333	697.7	143.6886	79.85	49.65	29.9905	221.7521	768.1	8.725	56.75	18.2	38.30539	1.908	63.7	15.025	33.09425
23			1059.4	45.43333	703.65	136.137	74.9	46.5	31.12519	223.1767	764.7	-3.45	57.175	19.125	38.73951	1.073525	57.325	14.65	28.9531
24			1067.15	44.83333	715.125	132.7407	72.925	47.475	28.56913	225.0951	758.2	-6.475	55.5	19.825	36.90058	1.035778	52.725	13.8	26.33677
25			1085.225	45.96667	725.3	136.5498	73.6	50.75	31.45234	225.7114	756.9	-1.3	54.55	17.025	37.71472	0.914388	57.1	13.8	28.95014
26			1099.45	46.96667	732.85	139.2865	74.25	52.95	33.05734	225.6124	756.8	-0.1	57.65	18.2	39.66353	1.021733	60.15	14.375	30.69362
27			1124.2	48.4	747.425	144.3169	75.625	58.4	34.01585	224.8948	763.9	7.05	57.25	18.4	39.21579	1.009765	63.925	14.725	33.56371
28			1132.575	49.03333	754.075	145.1951	76.525	60.075	31.49928	225.7254	774.3	10.475	57.825	18.375	39.75066	1.015556	66.7	14.9	34.87364
29			1138	49.6	761.975	146.6452	78.2	59.1	31.08663	225.0204	784.2	9.85	59.5	19.625	40.46549	1.055917	69.4	15.275	36.20077
30			1146.15	50.5	772	152.4376	79.725	66.625	30.18139	226.1347	787.5	3.35	60.1	19.9	40.72708	1.154277	71.7	15.6	37.0538
31			1160	51.53333	781.15	157.8886	82.825	68.65	30.98793	227.4053	794.2	6.625	59.15	19.85	39.98624	1.08149	75.1	15.8	36.91467
32			1187.775	53.1	798.375	165.8004	85.775	76.5	31.65788	229.767	807.3	8.15	60.75	20.475	40.87545	1.203189	76.9	16.1	38.65473

It looks very similar to the WK3 version, but there are a couple of key differences. First, a couple of rows have been left out – those labelled ‘Dataset source’ and ‘Date of data’. More significantly, the data are defined through named ranges. The first named range must include the rows starting one above that labelled ‘OEF Mnemonic’ through ‘Variable/Residual’, and it must be named TO_OEFNOW32_HEADING. The second named range must include the row above the one labelled ‘Periodicity’ through all the rows of data that follow and it must be named TO_OEFNOW32_DATA. If it is necessary for data to be found from more than one sheet in the workbook, then the format would be duplicated and the range names would have, in the first instance a 1 appended to them, in the second, a 2 and so on.

11.3 Examine/Change Coefficients

The parameters that control the simulation process may be examined and adjusted if desired. After clicking on Examine/Change Coefficients, the following screen will appear:

The boxes show the coefficient number, its purpose, and its current value, which is repeated in the box labelled New value. To change the coefficient, click on the New value and replace it with the desired number. To switch to another coefficient, click on the **Coeff No** box, and replace the value in it, then press the Tab key or click on another box. Alternatively, click on the pull down arrow next to the description of the coefficient's purpose to see a list of all of the descriptions, and select one of them. Some of the coefficients are used to control which countries and blocs in the model are to be solved. These coefficients are set when you choose either all countries on the solve screen or make a selection from the list of countries if you do not choose all countries.

Key coefficients that the user might wish to alter are:

- 1 Maximum number of iterations allowed in any period. Default is 40.
- 2 Maximum number of variables to fail convergence before run aborted. Default is 200.

The model must be solved to incorporate the new coefficient values into the database. Databases created from one containing altered coefficients will also contain those new coefficients.

11.4 Add/Remove fixes

The first option allows the user to remove all fixes on a portion of the historic data on a database. This is useful in setting up a database for a counterfactual historical simulation. Simply set the date range desired, check the box labelled **Remove All Fixes**, click on **OK** and solve the model.

The second option is to remove a fix on a single variable, the one currently shown on the variable change screen. Again, set the date range, click on **Remove Fix on Current Variable**, click on **OK** and solve the model. This might be desirable if the user has fixed down an endogenous variable to create a new baseline, and then wants to work with that variable able to react to other changes in assumptions.

Finally, the current variable can be fixed to its current values, effectively making it exogenous at those values. To do this, check the box labelled **Impose Current Variable Values**. There are two choices as to how this is to be done. If only the Impose Current Variable Values box is checked, then the variable will be fixed onto its own residual. That is, the residual will take on whatever values are required for the calculation to yield the fixed value of the variable. This is the most common way of fixing variables.

However, it is possible to fix the values of a variable by using the values of other variables. These other variables are referred to as instrument variables. An example would be to set a path for the saving rate, and then ask the model to impose whatever values are necessary on personal consumption to achieve that saving rate path. To do this, make the saving rate the active variable on the variable change screen and set its path as desired. Bring up the **Add/Remove Fixes** box, set the date range and click on both the third and fourth boxes, **Impose Current Variable Values** and **Impose Values Using Other Variables**. This will bring up the following box:

Click on the pull down list next to the country and/or variable name for the instrument. In this case, the instrument variable, consumption, would be C. Determining the ratio is critical to this process. For each iteration, the difference between the calculation of the target variable and the value that period has been fixed to is multiplied by the ratio and added to the value of the instrument variable. Since the saving rate goes down when consumption rises, the relationship is an inverse one and the sign on the ratio must be negative. The relative size of the variables must also be considered in setting the magnitude of the ratio.

The saving rate is almost certainly a number between zero and 20 for most countries, while the level of C is likely to be much larger. To enable the model to converge on the fixed data in a relatively small number of iterations, the ratio must be fairly large – in the case of the US, it works out to be -10. Enter the ratio, and click on **Add** to transfer the information to the clear field to the left of the box. More than one instrument can be chosen for a particular target variable, say if you wanted to fix a path for GDP and distribute the impact proportionately among the major components. The multiple instruments, with their ratios, will be collected in the field. When all have been determined, click on **OK** to return to the Add/Remove Fixes box, click on **OK** again, and then solve the model.

Imposing Values Using Other Variables

Instrument	Ratio
US	C

C,US,-10.

Add

Delete

OK

Cancel